One other aspect of (l)ngaan which should be mentioned
252 in connection with food and health is the opportunity for con-
796 tamination of food. The villagers did not associate sanitation
751 with health, hence the hazards of a community meal which many
[753] persons helped to prepare were many. Two incidents observed the day before an ordination in early April, will illustrate. In the final stage of making Chinese noodles, rice flour paste was extruded through a perforated disk into an enormous pot of boiling water. When done, the product was removed with a fish net, and plunged into the canal to cool, after which women helpers spread it out on banana-leaf covered trays. Dishes were also washed before use in the canal, which was then too low for boats. Since, however, many people drank untreated canal water at this season (see p. 28), the added hazards for the participants caused by these procedures may have been slight.

262 In summary, food plays a major role in ceremonies and
792 festivities, which are concentrated in the 3 months' dry season. Proposals for dietary improvement in Bang Chan must take into account not only the possible effects of the (l)ngaan season on the total nutrient intake, and on opportunity for exposure to contaminated food, but also the importance of these affairs from the standpoint of merit and prestige, and the relatively great financial burdens which villagers therefore undertake because of them.

QUANTITATIVE DIETARY STUDY: FOODS EATEN AND ESTIMATED NUTRIENT INTAKE OF SELECTED FAMILIES IN BANG CHAN

Procedure

121
125
Selection of the Sample

146 Medical inspection designed primarily to discover possible signs of nutritional deficiency was carried out in advance of the family dietary study. The suggestion of Grant (1948) that matched groups, of contrasting economic or other status be studied, appeared to be appropriate to the situation in Bang Chan. Our hope was to be able to select from the random sample of families given medical inspection (Hauck, 1956) a group of families (A) in each of which several members had clinical signs which might be evidence of malnutrition, and a group of families similar in age and sex distribution (B) in each of which the members were largely or wholly free from such signs.

125 When the medical inspection of the random sample was
146 complete, however, too few of the families were found to meet our criteria for inclusion in Group A, i.e. the group of apparently less well nourished families. Additional families for

125 146 this group were located by checking the list of school children, all of whom had been examined, for instances in which 2 or 3 children in one family had signs possibly indicative of malnutrition. The remaining members of their families were then examined. Families appropriate for Group B were chosen from those in the random sample.

Note that the groups for inclusion in the weighed dietary study were selected on the basis of apparently contrasting nutritive status. They did not represent a random sample of village families, although 7 of the 11 families included in the dietary study were in the random sample chosen for the medical inspection. In the absence of recommended dietary allowances for Thai, study of food intakes of two such groups seemed likely to yield more useful information than would be obtained from a dietary survey of a random sample of the population.

The groups chosen for study included 11 households, 6 in Group A and 5 in Group B, with 30 members in each group, paired so far as possible according to age and sex. When the survey was begun, however, 2 additional members were found in the households in Group A and 7 additional members in Group B. These were relatives and hired helpers who remained in the households throughout the survey year. The field worker who carried out the dietary study rearranged the matching plan somewhat, so that 32 reasonably well matched pairs were obtained (Table 6). In planning this rearrangement, the observer had in mind pairing persons of similar size, so far as possible, in addition to pairing by sex and approximate age.

Estimation of Caloric and Nutrient Allowances

Because of the 5 additional unmatched persons in Group B, males aged 23, 15 and 4 years, and females aged 79 and 82, some means was sought of checking the validity of comparing calculated per capita food and nutrient intakes for the two groups. By selecting matched groups differing in apparent nutriture, we had hoped to avoid comparing calculated nutrient intakes with an arbitrary standard, but comparison of estimated per capita nutrient needs of the two groups appeared to provide one means of checking the probable comparability of our groups, even though their members were not all matched as originally planned. No nutrient allowances had been proposed for Thai, however, so Nicholls' (1951, p. 315) allowances for people in the tropics were modified by taking into account information in Recommended Dietary Allowances of the National Research Council, Food and Nutrition Board (1953) and FAO recommendations concerning caloric requirements (FAO Committee on Caloric Requirements, 1950). The resulting basic table of allowances for Thai people in Bang Chan (Table 16, p. 104) is conservative, and probably represents something like a

[Text continues on page 57 --- Analyst]

125 Table 6. Persons in the Two Groups of Families in the Dietary Survey, Matched According to Age and Sex, So Far As Possible

Group A (6 families, 32 persons)			Group B (5 families, 37 persons)		
Code Number	Sex	Age	Age	Sex	Code Number
521	M	63	64	M	711
621	M	52	53	M	701
995	M	50	58	M	601
991	M	41	42	M	751
981	M	38	39	M	731
971	M	30-33	25	M	603
523	M	23	20	M	605
623	M	21	20	M	713
522	F	60	59	F	712
622	F	49^{1}	49	M$^{1, 2}$	703
996	F	44	44	F	602
992	F	37	38	F	732
982	F	35	39	F	752
905	F	31	31	F^{2}	704
525	F	20^{2}	22	F	604
986	M	15^{2}	15	M	606
309	M	12	13	M	754
206	M	11	12	M	485
184	M	10	10	M	755
153	M	10^{3}	13	M$^{2, 3}$	705
266	M	10	7	M	167
524	M	5	6	M	733
483	F	13	15	F	702
320	F	12	10	F	229
130	F	10	10	F	128
107	F	8	8	F	180
187	F	7	7	F^{2}	706
997	F	8^{3}	16	F^{3}	753
983	F	6	6	F^{2}	707
984	F	3^{1}	4	M^{1}	756
972	M	1	2	M	735
985	M	3 mo.	3 mo.	M	757
			23	M$^{2, 4}$	709
			82	F^{4}	758
			79	F$^{2, 4}$	708
			15	M^{4}	714
			4	M^{4}	734

1. Not matched by sex.
2. Extra persons who were not in groups as selected.
3. Not matched by age. In the case of the 10 and 13 yr. old boys, actual body sizes were comparable.
4. No corresponding person in Group A.

125 146 nutritional floor for this population, beneath which maintenance of health cannot be assumed. From this table, allowances were estimated for persons of each age and sex, for Groups A and B (Table 17, p.105). Estimates were made for each quarterly period or Round, during which each family was visited once, and these were averaged to obtain mean per capita allowances for each group for the year (Table 18, p. 108). In each group, one woman was in late pregnancy during the third Round, and a new infant had been added to each group in the fourth Round. Since young infants in Bang Chan are given little more than mother's milk, allowances for the fourth Round were adjusted to account for an additional nursing mother, but not for the infant itself. Differences in estimated per capita allowances for Groups A and B were trivial (Table 18, p.108), hence we felt justified in comparing the estimated food and nutrient intakes of the groups as originally planned, even though Group B contained 5 persons not matched with persons in Group A.

Method of Collecting Data

124 125 The procedures we planned to use were first pretested in several households to give the observer experience and to be sure that the method would actually work under conditions in Bang Chan. Following the pretest, each family chosen was told in a preliminary interview, what the observer wished to do, and in what ways family members would be expected to cooperate (Appendix C, p. 109). All families that were asked to participate in the study consented. They were not notified in advance just when the observer would visit. Observations on each family included food intake for a 24-hour period, 4 times during the year: twice during the rainy season, and once each during the cool and the hot, dry seasons.

Survey days were planned so as to avoid special festivals when food preparation might be unusual. Six of the 44 survey days fell on (1)wan (4)phra, the weekly holy day. The families visited on (1)wan (4)phra did not, however, take food to the temple on those days, hence food preparation and consumption was probably not unusual.

Alternate visits to the families in Groups A and B were planned so that seasonal variations in food supply would not be apt to account for any observed differences in food intake. Again, our plan could not be fully carried out. Occurrence of cooperative transplanting and other interfering circumstances made some modifications in schedule necessary. Since the objective was to learn about the usual family food intake, the study was not carried on when several members of the family were away from home, or when the participating family was preparing to feed neighbors who were helping with farm work. In such a case, the field worker would go to the nearest

124 participating household which had not been visited during that
125 Round of the study. The order and dates of visits to Groups A
and B, data from which were used in calculating food and nutrient intakes are shown in Table 7. During three periods of
about one month each all visits were to families in Group A,
hence some differences in the use of foods between the two
groups might be attributed to the order of visits.

Table 7. Order and Dates of Visits to Households Participating in the Dietary Study[1]

Round	Date	Group	Household No.	Round	Date	Group	Household No.
I	May 26, '53	A	67	III	Nov. 26, '53	A	67
	June 4, '53	A	222		Dec. 3, '53	A	222
	June 11, '53[2]	A	2		Dec. 10, '53	A	2
	June 24, '53	A	12		Dec. 17, '53	B	21
	July 2, '53	B	21		Dec. 21, '53[2]	B	23
	July 8, '53	B	23		Jan. 7, '54	A	103
	July 16, '53	A	103		Jan. 14, '54	A	12
	July 23, '53	B	16		Jan. 18, '54	B	16
	July 31, '53	B	25		Jan. 28, '54	B	25
	Aug. 6, '53	B	20		Feb. 4, '54	B	20
	Aug. 13, '53	A	215		Feb. 10, '54	A	215
II	Aug. 27, '53	A	222	IV	Feb. 18, '54[2]	A	67
	Sep. 3, '53	A	2		Feb. 25, '54	A	222
	Sep. 10, '53	A	67		Mar. 4, '54[2]	A	2
	Sep. 24, '53	B	21		Mar. 9, '54	B	23
	Oct. 1, '53[2]	B	23		Mar. 18, '54	B	21
	Oct. 15, '53	A	103		Mar. 24, '54	A	103
	Oct. 22, '53[2]	A	12		Apr. 1, '54	A	12
	Oct. 29, '53	B	25		Apr. 5, '54	B	16
	Nov. 5, '53	B	20		Apr. 25, '54	B	25
	Nov. 12, '53	A	215		Apr. 30, '54	B	20
	Nov. 19, '53	B	16		May 8, '54	A	215

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1. Two visits, data from which could not be used due to abnormal circumstances, are not included.

2. (1)wan (4)phra, the Buddhist holy day.

124 125 On the basis of experience during the pretest, the observer began the 24-hour period of observation with an unannounced visit in the afternoon, in time to see the preparation for the evening meal. This proved to have several advantages. A householder whose home had been visited at the evening meal, and who anticipated the observer's return before breakfast, could restrain the dog, if necessary; or the homemaker might postpone washing the rice until the observer arrived to weigh it. Without such cooperation on the part of the homemaker, our records would have been much less complete [405] than they were. Since few village families had clocks, the time when the homemaker said she would start breakfast was always approximate.

125 262 Foods were weighed in both the raw and cooked states, and foods given to priests, fed to animals, left over, etc. were weighed so that the actual amount eaten by the family could be calculated. Previously cooked foods included in the survey meals were weighed and raw weights estimated from information obtained in other observations. If possible, snacks were weighed. School children and others who ate snacks away from home were asked to report them to the observer, and weights were estimated. 128 262 The guides prepared for the observer are included in Appendix C, pp. 110-111. Data were recorded on the schedule, shown in Appendix C, pp. 116-120. and essential information such as the weights of food, after allowing for weight of containers, was later transferred to the shorter form shown in Appendix C, p. 121. As examples some of the data obtained on 3 of the 44 survey days are shown. Examples of notes on procedures in food preparation are included with these records. For examples of notes on the food intake of individuals see Appendix A, p. 97.

Calculation of Nutritive Value of the Diets

Figures from the original records were transferred to the Form for Calculating Raw Weights of Foods Eaten (Appendix C, p. 121), and the edible portion of each raw ingredient consumed was calculated by adjusting the gross amounts according to the use made of the cooked food and the number of family members present. Procedures followed are outlined in Appendix C, pp. 113-115.[1]

Few analyses of Thai foods had been made in Thai laboratories, and most of these were for proximate composition only. Therefore, data from other available sources were used. Since Handbook No. 34 of the United States Department of Agriculture "Composition of Foods Used in Far Eastern Countries" (Leung

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[114] [1] Many of the calculations were checked by Mrs. Mary Barkley Campbell, who made independent use of the data.

128 per day were calculated for Groups A and B by Round and for
262 all survey days (24 days for 6 families in Group A, 20 for
5 families in Group B). The total amounts eaten per capita
per day, of various food groups, and the relative nutrient
contributions of these groups were also calculated.

Results and Discussion

Socio-Economic Situation of the Two Groups of Families Studied

124 General Socio-Economic Conditions. - In the course of the study the observers were able to obtain information, both by inquiry and direct observation, on the economic condition of the families. Questions about land holdings, the amount of land farmed, number of working buffaloes owned, number of priests to whom food was given and sources of income, were asked during the second Round of the survey, after the participants were acquainted with both the field workers and the procedures. As raw foods were weighed, the observer asked if they were home grown or prepared, and recorded the cost of foods purchased.

125
146 Although our sample was not stratified with respect to
184 economic condition, the families in Group B, i.e. those
chosen for apparently better nutriture, proved to be more
[434] prosperous than those in Group A (Table 8). With the exception of Household 222 in Group A, rice production was the
[435] main source of income. Families in Group B had a greater
capital investment in land and buffalo, and worked more land,
having more productive hands per family available. Farm work
was finished sooner, hence members could begin intensive
[859] fishing earlier than in Group A. All children aged 13-15, in
both groups, did light farm work and/or selling in market,
cooking, baby tending and care of buffalo. In all households,
husband or wife or both came from old families in the community, hence had extensive kinship relations.

125 From the viewpoint of parents, the "peak of life" was
511 the time when children were no longer dependent, but produc-
592 tive, unmarried workers whose earnings stayed within the
434 family. Household 16 was such a family, forward looking,
463 progressive and optimistic. The successful and respected
couple in Household 25 would enter this "peak of life" situation in a few years. Household 20 included a widower and his almost grown daughter living with his younger brother and the latter's family, and their senile mother, in harmonious cooperation. Ample land, housing, buffalo and farm labor combined with other skills, made for good living. In Household 21, two strong, unmarried sons still lived with their elderly parents. The only poor family, of low status, in Group B, was Household 23. By great industry, especially in

[Text continues on page 63---Analyst]

125 fishing and selling vegetables, they managed to obtain a fair
592 diet. The father's skill as a masseur was valued especially
511 at periods of heavy farm work, after childbirth, and by the
434 cooks at a ceremonial feast. This brought in from 2 to 12
463 baht per week.
[262]

In Group A, Families 67 and 103 were at the most difficult
period of life, with young, dependent children, and
[235] housing, land and equipment to be acquired. By great industry,
including egg production from a flock of 60 chickens,
and by severe "belt-tightening," Household 103 was lifting
itself into a propertied position. The parents in Household
[857] 67 were shy. One or the other of the two older children
[157] often stayed home from school to look after the baby, so
[124] that both parents could work. Husband and wife in Household
12 were both very shy, the only ones in the survey group who
[152] were at all reluctant to participate. They seemed ashamed
of limited food. The wife was frequently ill. In Household
[443] 222, the 14-year old daughter often gathered and sold vegetables
[283] at Minburi before school in the morning. She might
have full charge of the younger children for days at a time.
A daughter who worked as a servant in Bangkok contributed 50
baht per month to this household. In Household 215, the
[465] activities of the wife as medium were predominant. Pay included
food, often cooked, and the free use of 3½ rai of
land, as well as cash. Maintenance of a son in school in
[435] Bangkok cost about 1000 baht per year plus 60 tang of rice.
[871] In Household 2, the elderly wife's services as "boss-buyer
and cook" at ceremonials, and as marriage go-between did not
bring in cash, but gifts, clothing and much participation in
feasts.

431 All families in the survey group were Thai Buddhists,
262 and 6 of them offered food to priests more or less regularly.
792 On 17 of the 24 survey days when the observer visited these
[779] households, food was offered. Two of the 5 families that
did not customarily give food to priests, did so on one and
two survey days, respectively. In one case food was offered
to a son who had been recently ordained. Rice was always
included in the food offered, and in 3 of the 20 instances
observed rice only was given. The weight of cooked rice
given by one family in one day ranged from 185 to 1210 grams,
with an average of about 600 grams. In 16 instances, some
cooked food such as fish or vegetable curry was given with
the rice; in one instance fresh pineapple was given.

511 Cash Expenditures for Food. - Mean total, and per
[128] capita daily cash expenditures for food for survey days, are
shown, by household in Table 3. (See Table 2, p. 23 for
division of food expenditures for Groups A,B) Although cash
expenditures for food varied considerably, the amounts in
all cases were small, and approximated figures obtained by
Janlekha (1955) for 106 households. Larger consumption of
animal products, which were the most expensive items purchased,

APP3NDIX C

Guides Prepared for the Observer Who Carried Out the Dietary Study

114 125 124

Preliminary Visit to Participating Households

Households selected for dietary study are to be visited in advance, acquainted with the procedure which we wish to follow, and asked for their cooperation.

The following points should be emphasized:

1) Meals should be prepared as usual both in amount and kind. Workers wish to know how much food and what kind, the family eats.

2) Each item of food which enters into the meal preparation will be weighed before cooking.

3) Each prepared food (as cooked rice, fried fish, curry, etc.) will be weighed when the preparation is finished.

4) Amounts of prepared food given to priests, fed to animals or left over, must be weighed, so that the amount of food actually eaten by the family can be calculated.

5) As often as possible survey members would like to be present during the meal, but will not accept food from the household.

6) Each member of the family will be asked to report to the survey worker what is eaten between meals. If the snack is eaten at home, it should be brought to the survey worker first, to be weighed. If the snack is eaten away from home, individuals are asked to tell the survey worker as clearly as possible what was eaten, and how much.

Preliminary information to be obtained at this interview:

1) Usual number of meals taken by the family at this season.

2) Usual time of meals.

3) Time when food preparation is started in the morning, and when evening meal is over.

The family should be told that the survey workers will come sometime during the next two weeks. They should not be told which day, as that might lead them to make some changes in their usual diets, either consciously or unconsciously.

114 The schedule of visits should be such that each day of
124 the Buddhist "week" will be appropriately represented, i.e.
125 the day before the holy day, the Buddhist holy day, and the
5 or 6 days which follow. Days of special festivals should
not be included in the dietary survey, although the investigators should attend many of these, and record observations on the foods served.

Dietary Survey Proper: General Procedures, with Alternative Suggestions

Twenty-four hour period. - Each visit should cover a 24-hour period. After preliminary experience, a good plan seems to be to go in the early afternoon, in time to see the preparation for the evening meal, and to return early the next day, remaining until the 24-hour period is up. This plan has several advantages over making one's first appearance before breakfast:

1) The homemaker may be introduced to the procedure at a time when she is less hurried than she is apt to be in the morning, when she must have food ready for the priests at a fairly definite time.

2) Scales and other equipment may be left overnight, so that these need not be carried before dawn, along with food and water for the survey worker.

3) The risk that food preparation will be started before the worker comes is less if the homemaker expects the survey worker before breakfast.

4) If the worker's visit is anticipated, someone at the house will restrain the dog if necessary.

5) For the more remote households, arrangements can probably be made to stay overnight at the home, or nearby, without previous notification as to the exact date of one's visit.

Because the observer may leave in the afternoon before children return from school, she should ask about snacks eaten away from home on the first afternoon, so that record will be obtained of such snacks eaten on one day, though not necessarily during the same 24-hour period as the other meals recorded.

Number of Visits. - Aim to visit each of the 11 families once each 3 months, i.e. 4 times in the year. This means once during the cool season, once during the dry season, and twice during the rainy season, i.e. early and late. From May 25, 1953 to the end of April 1954 there are 49 weeks. In a schedule calling for one survey day each week, this would allow 5 weeks for unforeseen circumstances which might interfere,

114 or for planning time off because of holidays, celebrations,
124 etc.

125 Scheduling of Visits. - Plan to see the families in rotation, going to those in groups A and B on alternate weeks, so that seasonal variation in food supply will not be a major difference between the two groups. The survey worker must have in mind another nearby home, however, which might be visited if the original plan cannot be carried out on a given day.

The survey worker should not give advance notice of the exact day when she plans to come, unless the householder has specifically requested this. Even when notice is requested, it need not be long in advance, i.e. one could stop by in the morning and ask if it would be all right to come back in the afternoon to watch supper preparation.

Directions for Use of Schedule 8 on Which Data Obtained During the Dietary Survey are to be Recorded.

Most of the items in this schedule may be filled in from census information or by direct observation by the survey worker. The worker will need to enquire re item E. the makeup of the food consumption unit, and J 4, the cost of raw foods purchased. The survey worker should try to observe other items during the day, and fill in by inquiry, if necessary, at the end of the day. Note whether information was obtained by observation (ob) or inquiry (q).

A. Hamlet and house number should be written in from the census information, and should correspond to that on schedule 3 for the same household.

B. Each Household to be visited for dietary survey will be given a key number in advance. This number should be inserted here.

C. Head of household (from census information).

D. Religion. - Some dietary practices are associated with religion, therefore indicate whether the household is Buddhist or Islam by checking the appropriate space.

E. Composition of food consumption unit: List here all persons whose food is prepared in the kitchen which the observer is visiting. Note that all persons living in one household (i.e. at the same house number) may not belong to one food consumption unit.

F. Source and treatment of water. - Find out, by observation if possible, from what source or sources water is obtained for drinking and food preparation, at this season. Note

114 whether or not water is boiled or treated otherwise before
124 use.

125

G. Garbage disposal. - While making the dietary survey, the observer should note what is done with garbage. Is edible waste given animals? Is garbage disposal carried out in such a way that it will not attract flies, etc.?

H. Protection of food against contamination. - The observer should note what means are used by the householder to protect both staple and perishable foods from contamination by insects and animals. If the householder's practices are not consistent, the observer should note this, either on the schedule, or in her note book. In the latter case, the schedule should be plainly marked "see notes."

I. Family member observed at meal time. - We have been unable to think of any plan for weighing foods consumed by individual members of the family without disturbing the customary eating procedures. The observer may be able, however, to get some idea as to how food is distributed in the family, by observing one person at a time, and recording her estimate of the individual food intake.

The person chosen for observation should be one of the family members who would be most vulnerable to an inadequate food supply, for example a pregnant or lactating woman, a young baby, a growing child or an old person. The observer should fix her attention on the person to be observed, throughout the meal, and should record as well as possible the amounts eaten of each type of food. Record amounts taken onto the plate, amounts left on the plate at the end of the meal, number of bites or spoonfuls of each item eaten a) directly from the serving dishes and b) after the food is put on the plate. Check your estimates of amount eaten by the person observed with reference to the total prepared for and consumed by the family.

From observations of this sort we hope to get information on questions such as the following:

1. When a child is said to eat all adult food, does this mean that the kinds of "with-rice" and the proportions of rice to "with-rice" are the same for him as for adults?

2. If a pregnant or lactating woman says she eats as usual except for the hot tastes, does this mean a) that she omits or decreases intake of peppery foods and eats no more than usual of other foods or b) that she omits or decreases intake of peppery foods and eats more rice and/or less highly seasoned "with-rice" items? In the case of a child, note carefully any remarks made by adults urging him to eat more of, or suggesting that he eat less of a given item.

114 J. Food preparation and consumption
125

In the schedule, each column has a descriptive heading and a number. On the sheet used for calculating "adjusted consumption," the numbers alone are used.

1. Menu. Record title of meal as "breakfast" or "dinner" and time served. List all foods served at each meal, including leftover foods from the previous day. If foods left over from an earlier meal on the same day are used, note this fact, since weight of raw food, noted when the food was prepared can be used in calculation.

Raw ingredients

2. Kind. Note here the name of each ingredient, and any description needed, i.e. fat or lean pork, hen or duck egg, etc. Since rice is served at each meal the terms "home milled" and polished are listed here. Cross out the inappropriate one.

3. A.P. (as purchased) weight. Record here the weight of the food as it is purchased, or as it comes from the storehouse, garden or canal. If several food items are used in preparation of one dish, bracket these together.

4. Cost. For foods which have been purchased, record cost of the amount used. For example, if 3 fish were purchased for 1 baht, but one only was prepared at this time, record 33 stg. as the cost. If the food was produced at home, grew wild, or was received as a gift, note this.

5. Inedible refuse. Note weight of inedible refuse which is discarded during preparation. If the inedible portion is included in the cooked dish, weigh it later and record the weight in this column.

6. E. P. (edible portion). Add together all weights of inedible refuse for a given item to get the total for item 5. Subtract 5 from 3 to get this figure.

Note on weighing raw food: So far as possible, weigh raw food and inedible refuse on waxed paper (weight negligible) or in standard utensils (enamel plate, plastic bowl, etc.) the weights of which are known. Record: weight of A.P. food on utensil minus weight of utensil equals weight of food. For example, if rice is weighed in a plastic bowl weighing 90 g., and the total weight is 870 g., 870-90 = 780 (g. rice). The observer is less apt to make mistakes if she uses the same containers repeatedly, than if containers used are provided by the household, and vary widely in weight. The balances provided for weighing food are 3 kg./10 g. and 1 kg./4 g. Small amounts of food should always be weighed on the 1 kg. scale, since it is more sensitive than

114 the 3 kg. scale. If a number of items are used in small
125 amounts, weights may be approximated more closely if the items are placed one after another, on a piece of waxed paper, noting each time the added weight causes the indicator to move. Thus the red or green pepper alone might not weigh enough to affect the indicator, but these together with other green or leafy materials used (as lemon grass, coriander leaves and sweet basil) might weigh 8 grams. In a marginal diet, the contributions of such items to the nutritive value of the diet should not be overlooked.

Cooked foods. - For cooked foods, which must often be weighed in a container provided by the family, columns are provided for weight of dish (7), of dish plus food (8) and of food (9). For example, if rice is to be cooked in an aluminum kettle, weigh the empty kettle and record this weight in column 7. When the rice is done, and ready to serve, weigh kettle plus cooked rice, and record this in column 8. Subtract 7 from 8 and get the weight of food, to be recorded in column 9.

Use of cooked food

10. If food is given away, weigh dish and food before and after the food is offered, to get weight of food given away. Record the weights before and after and the difference, in column 10. Specify whether the recipient is priest, neighbor, relative etc. If inedible portion is included, note this and weigh it if possible.

11. Fed to stock. If inedible portion is given, note this and weigh it if possible. Specify if fluid only is given, or if part of the complete dish.

12. Edible waste. Specify if this is fluid only or a representative part of the complete dish.

13. Left over. Specify if this is fluid only or a representative part of the complete dish. Note if inedible portion is included and weigh it if possible. If you must leave in the evening before all family members have eaten, explain that you wish to weigh all left over food, and arrange to have it kept in separate dishes so that you can weigh it in the morning.

14. Food eaten. Weigh the pot or serving dish before and after the meal. At the end of the meal, weigh inedible portions left on plates or in the pot, and correct for those to get the weight of cooked food actually eaten.

15. Persons eating. Record here the number of persons in the consumption unit (item E) minus the number absent from this meal (x), plus the number of guests (y). Thus if there are 6 members of the family, one of whom is away, write 6 - 1 x = 5. Similarly if there are 6 members of the family,

114 plus a guest, write 6 + 1 y = 7. If one member of this family
125 is away but a guest is present, write 6 - 1 x + 1 y = 6. In calculating, if the number of persons eating a given meal differs from the usual number in the household, the amount of a given food eaten is multiplied by a factor representing the *number of persons in the household/number of persons present*. Thus if a guest shares the meal in a household consisting of 6 persons, all of whom are present, the weight of each food eaten should be multiplied by 6/7 to get the "adjusted consumption," for which nutritive value is to be calculated. Similarly, if 5 only of the 6 members of the household eat a given meal at home, the weight of each food eaten should be multiplied by 6/5 to get the "adjusted consumption."

16. *Methods of preparation*. Describe the method of preparation clearly enough so that one who was not present could visualize it. Specify if soaking or cooking water is discarded. Note cooking time and appearance of cooked product when these give a clue as to probable nutritive value. Thus greens which are added at the last, cooked only a short time so that they retain their color, may be expected to retain a maximum amount of their vitamin C. Note type of equipment used.

K. *Snacks*. Record snacks eaten between meals on the separate sheet provided. Ask persons who eat snacks at home to bring them to you first, to be weighed. Question each member of the family about foods eaten away from home during the day, and record the kind of snack, description, and weight. (Estimated weights should be put in parenthesis, to distinguish them from observed weights.) If the snack was purchased, record the cost. Under "person eating" note the name of the family member who ate each snack.

From these data we hope to get an idea as to the nature and probable nutritive value of snacks, and whether these are eaten by all or most members of the family, or by certain ones only, as by the school children at recess.

SCHEDULE FOR DIETARY STUDIES

125 Cornell University Thailand Project 1952-53 Schedule 8
Date.............

A. Hamlet........ House No......... B. Household No.........

C. Head of
Household a)............ b)............ D. Buddhist.......
Islam..........

E. Food consumption unit. List here the names of persons who usually eat food prepared in the kitchen where observations are being made:

1)............... 5)................. 9)................
2)............... 6)................10)................
3)............... 7)................11)................
4)............... 8)................12)................

F. At this season what kind of water is used for each of the following purposes, and what treatment, if any, is given to it?*

USE	SOURCE			TREATMENT			
	Rain	Canal	Fish-pond	None	Alum	Boiling	Other (what)
1. Drinking, adults							
2. Drinking, children							
3. Washing vegetables							
4. Cooking							
5. Washing dishes							

G. How is garbage disposed of? (check)
1. Buried.................
2. Burned.................
3. Thrown into canal......
4. Thrown elsewhere.........
5. Fed to animals...........
6. Other....................

* Indicate whether answer is obtained by query (q) or observation (obs.)

• 125 H. Does the householder attempt to protect food against contamination by insects, animals etc? Note means used.

Means used	Type of food 1) Dry rice and other nonperishable foods	2) Perishable foods & left-over cooked foods
1. Container covered:		
a) Solid cover		
b) Fiber cover		
2. Food safe:		
a) Screened		
b) Ant-proof legs		
3. Other		
4. None		

I. Family member observed at meal-time . . . .
Notes re kind and amount of food eaten by this person:

Food Preparation and Consumption Sept. 25, 1953 Household No. 21

Menu 1	Raw Ingredients				Ined. Ref. 5	E.P. 6	Cooked Foods		
	Kind 2	Wt. A.P. 3	Cost 4				Dish 7	Dish + Food 8	Food 9
			Bt.	Stg.					
Meal Time 4:30 a.m.							800	2990	2190
		2180-800					120	1280	1160
Cooked rice	Polished	= 1380					190	850	660
									4010T[1]
(1) Bauaun stew	(leftover)						450	915	465
(2) Sa-(5)noo stew	Coconut meat (to make milk)	700-180 = 520		50		520)			
	Dried chilies	24		15		24)			
	Onion	8		4		8)			
	Galangal (HG)[2]	8				8)			
	Garlic	4		2		4)			
	Lemongrass (HG)	12				12)			
	Bergamot rind (G)[2]	4				4)	450	1390	940
	Salt	30				30)	130	312	182
	Serpenthead (C)[2]	320-120=200				200)	130	300	170
	Shrimp paste	6		3		6)	130	260	130
	(2)Sa-(5)noo flowers (G)	550			580-520 = 60	640-150 = 490)			1422T
	Coconut milk					1220-450 = 770 }			
	Palm sugar	240-200= 40		24		40 }			
Cooked rice	(leftover)						520	800	280
Fried duck egg	1 Duck egg	76			21	240-185 = 55			
	Coconut oil	16		8		16			
	Onion	4		2		4			
	Fishsoy	10		5		10	180	260	80

1. T equals total weight.
2. HG, G and C stand for home grown, gathered and caught, respectively.

Food Preparation and Consumption (continued) Sept. 25, 1953 Household No. 21

Use of Cooked Foods						
Given away 10	Fed to Stock 11	Ed. Waste 12	Left Over 13	Eaten 14	Persons Eating 15	Method of Preparation
Cooked rice 850-190= 660 (to 3 priests)			0	3350	4	Rice, 4:30 a.m. She washes rice two times and lights the fire. Then she puts rice pot on fire at 4:35. Rice water is drained off at 5:00. Rice pot is put on fire again from 5:15 to 5:25.
			(1)Bauaun stew (leftover) 0	465		(1)Bauaun stew is reheated from 5:00 to 5:15 a.m.
(2)Sa-(5)noo stew 312-130=182 300-130=170 260-130=130 482T (to 3 priests)			0	940		(2)Sa-(5)noo stew, 5:20 a.m. Dried chilies (after soaking in water for a while), onion, garlic, galangal, lemongrass, bergamot rind, and salt all pounded together. 5:25 She crushes coconut meat with water five times over colander. Shrimp paste is mixed with (4)nam (4)phrig at 5:40. The pot of coconut milk is put on fire at 5:42. (4)Nam (4)phrig is mixed with boiled coconut milk at 5:55. Fish is put into the pot and water from crushed tamarind at 6:00, (2)sa-(5)noo flowers at 6:05. The pot is put down at 6:12 a.m.
			Cooked rice (leftover) 0	280		
			Fried duck egg 0	80		Fried duck egg. The pan is put on fire at 6:15 a.m. Duck egg is mixed with pieces of onion and fishsoy. Coconut oil is put into the pan at 6:20. Stirred egg is fried from 6:20 to 6:25.

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[252]
[435]

Food Preparation and Consumption (continued)   Household No. 222, June 4-5, 1953

K. Snacks

Person eating 1	Time 2	Kind and description 3	Weight (or approx. wt.)			Cost 7	
			A.P. 4	Ined. ref. 5	E.P. 6	Bt.	Stg.
			g.	g.	g.		
June 4/53							
Girl, 8 yrs.	12:00m	She ate a half fruit of pineapple at home. It was bought from the selling boat.	(375)	(195)	(180)		20
June 5/53							
Girl, 8 yrs. Boy, 10 yrs. Girl, 13 yrs.	All day	7:40 - The pot of truffles (gathered from the fields) is put on fire. It is boiled with water and salt. Truffles: 525-72 = 453 gm. Salt: 35 gm. It is finished at 8:28.	453				
Boy, 10 yrs.	8:46	He eats boiled banana (HG)	48				
Girl, 13 yrs.	Early a.m.	She drinks coffee which is bought from the store near the Wat.					40
Father	10:13	He drinks one glass of milk which is bought from the store near Wat.					50

Form for Calculating Raw Weights of Foods Eaten

Dietary Survey, Bang Chan

Household No. 12 Date Jan. 14, 1954

Amounts of foods prepared and eaten

No. persons in household 3

Meal - menu	Raw ingredients				Cooked food	Use of cooked foods					Adjustments-raw wt.		
1	2[1]	3	5	6	9	10	11	12	13	14	For amt. eaten	15	For No. people
4:00 p.m.													
Cooked rice	Polished	610			1640				500	1140		3	
Baked egg plants	3 egg plants	370		370	240				0	240			
Fish "salad"	Lemongrass (HG)[2]	36		36)									
	Holy basil (HG)	44	20	24)	115				0	115			
	1 fish (cooked)	52	12	40)									
	Lime (1/2 fruit)	30	12	18)									
Cooked rice	(Leftover)				250				0	250			
6:55 a.m.													
Cooked rice	Polished	950			2390				800	1590		3	
Roasted fish	2 fish	112			96				0	96			
Cooked rice	(Leftover)				500				0	500			
Chili sauce	Bird pepper (HG)	12		12)									
	Shrimp paste	10		10)									
	Garlic	8		8)	45				20	25			
	Palm sugar	10		10)									
	Lime	12	4	8)									

1. For identification of column numbers, see the original schedule, pp. 118-119 and pp. 113-114
2. HG stands for home grown.

Dietary Study, Bang Chan - Nutritive Value of Total Foods Eaten in 24 Hours

Household No. 16

Date: July 23, 1953
Persons Eating: 8

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Raw Ingredient	Adj. cons.	Calories	Protein gm.	Fat gm.	Carb. gm.	Ca mg.	P mg.	Fe mg.	Vit. A I.U.	B_1 mg.	Ribo. mg.	Niacin mg.	Vit. C mg.
Rice, home milled	3877	14074	295	43	3036	426	8568	46.5	(0)[1]	7.37	1.94	120.2	0[1]
Dried fish	450	864	189	7	0	293		11.3	0	0.27	1.40	20.7	0
Bottle gourd	1535	261	9	3	58	184	276	9.2	1075	0.61	0.77	15.4	154
Swamp cabbage	480	139	14	1	26	350	245	12.0	30240	0.34	0.58	3.4	154
(2)Phag (2)ka-(2)cheed	40	11	1	0	2	66		1.2	2400	0.04	0.08	0.3	28
Coconut milk[2]	1010	735	8	59	42								
Pork fat	36	325	0	36	0	0	0	0	0	0	0	0	0
Fishsoy	48	23	2	2					0	0.01	0.04	1.1	
Shrimp paste	16	19	4	0					0	0	0.02	1.0	-
Chilies, dried	20	49	3	1	6	32	74	0.5	115	0	0	0	10
Garlic	16	15	1	0	4	7	21	0.2	0	0.04	0.01	0.1	2
Bird pepper	10	3	0	0	1	2	-	0.1	600	0.01	0	0	20
Onion	4	1	0	0	0	1	2	0	2	0	0	0	1
Lime	4	2	0	0	1	(2)	(1)	(0)	0	(0)	(0)	(0)	1
Palm sugar	25	96	0	0	24	20	10	2.9	0	0	0	0.3	0
Salt	20	0	0	0	0	46	0	0.1	0	0	0	0	0
Total		16617	526	152	3200	1429	9197	84.0	34432	8.69	4.84	162.5	370
Average/cap.		2077	66	19	400	179	1150	10.5	4304	1.09	0.60	20.3	46

1. ( ) means imputed value; 0 means none or insignificant amount; - means no values available, but probably contains measurable amount; blank space means no information found.
2. See Appendix C, pp. 128-129.

2: Hauck et al. D.E-5 (1952-1954) 1958 AO7 Central Thai AO7 Bang Chan

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Dietary Study, Bang Chan - Nutritive Value[1]
of Total Foods Eaten in 24 Hours

Household No. 12

Date: Jan. 14, 195
Persons Eating:

Raw Ingredient	Adj. cons.	Cal- ories	Pro- tein gm.	Fat gm.	Carb. gm.	Ca mg.	P mg.	Fe mg.	Vit. A I.U.	B_1 mg.	Ribo. mg.	Nia- cin mg.	Vit. C mg.
Rice, polished	1335	4806	91	9	1053	80	1869	10.7	(0)	1.60	0.40	20.0	(0)
Egg plant	370	89	4	1	20	56	137	1.5	111	0.15	0.19	2.2	19
Fat fish	152	275	28	18	0	56	321	1.5	0	0.09	0.06	6.1	0
Lemongrass	36												
Holy basil	24	23	2	0	4	19	2	0.7	3024	-	0.55	-	1
Lime	22	8	0	0	3	9	5	0.1	0	(0.01)	0	0	6
Bird pepper	7	2	0	0	0	1	-	0.1	402	0	0	0	13
Shrimp paste	6	6	1	0	0				0	0	0.01	0.3	
Palm sugar	6	21	0	0	5	4	2	0.6	0			0.1	
Garlic	4	4	0	0	1	2	6	0	0	0.01	0	0	1
Total		5234	126	28	1086	227	2342	15.2	3537	1.86	1.21	28.7	40
Average/cap.		1745	42	9	362	76	781	5.1	1179	0.62	0.40	9.6	13

[1] ( ) means imputed value; 0 means none or insignificant amount; - means no values available, but probably contains measurable amount; blank space means no information found.

3:Hauck et al.   D-5   (1952-1954)   1959   AO7 Central Thai AO7
Bang Chan

SUMMARY

124 Information on health, care, and diet of mothers and small
125 children in Bang Chan, Thailand, was obtained primarily by interview, although some direct observations were made. In general, three areas of inquiry were included in this study: 1) clinical history, especially such information as might have a bearing on the nutrition and health of the child, 2) food intake at various periods, and 3) cultural customs and ideas of interest in relation to the Cornell Thailand Project.

In all, 66 mothers of young children were interviewed. Information on diet during pregnancy, postpartum, and lactation was obtained from women who were either in the stage under discussion or had only recently passed through it.

The description of child feeding practices is based on records obtained concerning 57 children from birth to two years of age, a majority of whom were visited from 5 to 7 times.

Information on growth in height and weight is based on observations made on 71 children, most of whom were weighed and measured 6 or 7 times. Observations were made for 30 of these children both before and after weaning.

843 During pregnancy most women in Bang Chan continued to eat as usual. A few expressed cravings for certain foods, and a minority thought some kinds of food should not be eaten during pregnancy.

846 During the postpartum rest period most women ate a very restricted diet. Rice and fish, with salt, were the foods considered by all informants to be appropriate for this period.

853 As a rule, diet during lactation, after the mother resumed her usual work, was the customary family diet. A minority of informants mentioned foods which should not be eaten by a nursing mother.

164 Evidence of the need to improve diets in this region was
146 provided by the occasional occurrence of beriberi or the history of beriberi among mothers as well as by medical inspection and family dietary studies.

853 Breast feeding was the rule in Bang Chan. For a majority of infants observed, breast feeding was continued into the second year, and some were breast fed for more than two years. Few received animal milk after weaning.

INTRODUCTION

121 In the study of food habits and health in Bang Chan, Thailand, mothers and small children were the focus of special attention. We were interested in these groups not only for their own sake, but because in an area where frank deficiency disease was not common, inadequacies in the diet might be reflected in the condition of these vulnerable groups to a greater extent than in the general population. Food habits in this rice producing village have been described (Hauck, Sudsaneh, and Hanks, 1958; Hauck and Hanks, 1959) and information has been presented on nutrient intakes of 11 families (Hauck, Sudsaneh, and Hanks, 1958; Hauck and Sudsaneh, 1959).

128 In the present paper, general procedures are described first, followed by sections on 1) health and care of mothers and 2) of infants, 3) diet of mothers during pregnancy, post-partum, and lactation, 4) feeding of infants and small children, and 5) growth in height and weight of infants and small children in Bang Chan.

PROCEDURES

124 Some of the information presented herein was obtained by direct observation, but much of it resulted from interviews, usually with the mother. One of our first tasks, therefore, was to develop appropriate schedules for such interviews.

Schedules for Interviews.

During the early weeks of getting acquainted in the community, we had preliminary unstructured interviews with a number of pregnant women and mothers of young babies. Frequently the child's father, a grandparent, or other family member would be present. Informants were encouraged to discuss infant feeding, common customs associated with childbirth, and other subjects
125 of interest to the research group. From the information so obtained and from conversations with workers at the Mother and Child Health Center in Bangkok, two schedules were drawn up. In general, both schedules included three areas of inquiry: 1) clinical history, especially such information as might have a bearing on the nutrition and health of the child, 2) food intake at various periods, and 3) cultural customs and ideas of interest in relation to the Cornell Thailand Project. In this category some items were included because of their interest from the standpoint of an anthropological study rather than because of any assumed relation to nutrition or health.

One schedule was designed to obtain information about the mother before and after the birth of a given child (Appendix p. 53) and the other for information pertinent to the nutrition and health of the child from birth onward (Appendix p. 56). Clinical history and food intake were included on both schedules. Spaces were allowed to record height and weight of infants and young children at each visit. Questions about cultural customs were included on both schedules, but most such information is reported elsewhere (Hanks, 1959). Descriptions of procedures used in the interviews and observations are included in the Appendix (p. 58). 125

Subjects.

At the beginning of the study we located as many households as possible in which there were pregnant women or young babies. The question, "What families in Bang Chan have young babies or are expecting babies?", was asked of the headman of each hamlet, of groups in a village store, and of families where we visited. We were able to follow up most of the leads obtained in this way. If possible the mother was visited sometime before the baby was born; soon after the birth (i.e. within a few days); and then when the infant was 1 month of age, 3 months of age, and at 3-month intervals thereafter. If the first interview occurred after the baby was born, the mother was asked about her diet during the pregnancy, the occurrences at the infant's birth, and his food intake up to the time of the first interview. 124 125

In all, 66 mothers of young children were interviewed. The first interview with 17 mothers was held during pregnancy; 34 others had infants less than one year old when first seen, and for 15 the youngest child was over one year of age. For various reasons, such as death of the infant, removal from the village, or failure to find mother and infant at home, complete records were not obtained in all instances. Moreover, after some experience we limited questions concerning pregnancy and postpartum care to women interviewed at these times or to women whose infants were under one year of age. The descriptions of diet during pregnancy, postpartum, and lactation are based on interviews with from 30 to 50 informants.

In order to obtain more information, particularly about infants going through the weaning period, older babies in the same households, or in the neighborhood of the households with young infants, were weighed and measured and their food intakes recorded. For these additional children the 3-month interval was usually followed, but they were not necessarily visited at the ages of 6, 9, 12 months, etc.

The description of child feeding practices is based on records concerning 57 children from birth to two years of age, a majority of whom were visited from 5 to 7 times.

124 125 Information on growth in height and weight is based on observations of 71 children, most of whom were weighed and measured 6 or 7 times. For 30 of these children, observations were made both before and after weaning.

HEALTH AND GENERAL CARE OF MOTHERS

145 Information obtained on menstrual history of girls and women in Bang Chan has been reported previously (Hauck, 1956). The median and modal reported age at menarche was 15 years with a range from 13 to 19 years.

163 Most married women in Bang Chan had children, and of 438 pregnancies reported by 84 mothers, over 90 per cent resulted in live births (Hauck, 1956).

843 Clinical History and Complaints During Pregnancy.

164 Most of the women interviewed reported no history of disease which might affect, or be affected by, nutritional status.

Four women had a history of beriberi; 3, a history of malaria; and one had active tuberculosis of which she later died. In relation to the current pregnancy, 6 women had minor complaints such as nausea in early pregnancy, faintness, and leg cramps. The physician considered these as probably physiological. Of the 4 women with more serious complaints, one who said she had pain in the abdomen and legs and difficulty in walking had manifest beriberi when seen a few days after delivery.

844 Delivery and Care of Mothers After Childbirth.

146 125 Information was obtained from 49 mothers concerning delivery and care after childbirth. For 43 of these women, ages reported were as follows:

Reported Age (years)	Number of Mothers
20 or under	7
21-25	11
26-30	12
31-35	6
36-40	6
over 41	1

The mothers interviewed had borne from 1 to 12 children. For 8 of them, this was the first child; but 25, a majority, had 2 to 4 children. In each case, the information obtained related to the most recent delivery. 846 844 125

Delivery. - In Bang Chan delivery usually took place at home. Four of the mothers we interviewed went to the home of a relative or relative-in-law. In two of these instances the relative was also the midwife; in the others the mother was apparently seeking a place where she could be more satisfactorily looked after than at home. 844 [602] [759]

Three women went to the Health Center at Minburi, about 3 miles from the center of the Bang Chan community, to have their babies. Two of these mothers expected to be delivered at home but were taken to the Health Center when labor proved long. All 3 returned home either on the day of delivery or the next day and lay by the fire. Two others, both school teachers, told us in advance that they expected or hoped to go to the Health Center, but when labor began they were unable to do so because their babies came so quickly. Aside from the 3 who went to the Minburi Health Center, only one of those interviewed went outside the community to have her baby. Informants usually considered the delivery uncomplicated; although, as noted, some labors were long. 844 743

Traditional midwives, who were not professionally trained but had learned from other traditional midwives before them, attended most of the mothers. One woman who was alone delivered the baby herself, one said she had no midwife but did not specify other help, and 2 had the help of women who did not ordinarily practice midwifery. The 3 women who were delivered at the Health Center had professionally trained help. Obstetrics as practiced in Bang Chan has been described by Hanks (1959). 844 759

Care of Mother During Postpartum Rest Period. - Traditional behavior during the postpartum rest period has been described by Hanks (1959). 846

Lying by the fire. - The ancient custom of (2)juu (1)faj[1] (literally to be by the fire) after childbirth was still observed by most women in Bang Chan. The chief difference between the practice as we observed it and as it was described in the Bangkok Calendar[2] for 1865 was in the length of the period. In former times this was as much as a month after the birth of the first child, with shorter periods for successive

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[1] See Appendix, p. 51 for glossary of Thai terms.

[2] The unsigned article entitled "Siamese Obstetrics" was presumably written by the Rev. Dan Beach Bradley, M.D., a Protestant missionary who compiled the Calendar.

853 fish and vegetables, when asked if they did anything to stimulate milk secretion. Other preparations, each mentioned once or twice, were cobra curry, fried (3)kuj (1)chaaj flower, pork soup with (3)kuj (1)chaaj leaves, dried peas and peppers cooked in palm sugar syrup. Some of the medications used were reputed to stimulate milk flow. Three women spoke of peacock brand medicine and one of a Chinese medicine in this connection. With respect to the Chinese medicine, another informant said she took it "to remove the serum which interferes with milk secretion." One midwife put herbs on her daughter's breast and expressed and discarded the "early milk" which was considered bad for the baby. No association appeared to be made between putting the baby to the breast and stimulation of milk flow.

896 312 Drinking water. - Information concerning sources of drinking water used by the mothers was obtained from 46 mothers of young babies. Of these, 20 used canal water, 23 rain water, and 3 used either one. In general, there was a relation between season and source of water used. Most of the mothers whose babies were born between March and October drank rain water, whereas from November to February a majority drank canal water. Some families had enough water jars to preserve rain water for much of the dry season, whereas others had few or no jars and, therefore, could save only small amounts of rain water on a day-to-day basis. In all instances, the water, whatever its source, was boiled for the mother during the postpartum rest period. Forty-six women said they drank the water hot; one said it was warm. One popular traditional midwife said, however, that if the mother had her baby in the hospital, use of boiled water for drinking and bathing was not necessary.

CONDITION AND CARE OF BABIES AT BIRTH AND IN EARLY INFANCY

125 All information to be reported concerning condition and care of babies at birth and in early infancy relates to infants who were under one year of age when first visited. Thirty infants were seen when they were under 3 months of age.

Condition at Birth.

164 165 The condition of the baby at birth was generally described as satisfactory. One infant who died on the third day, before we saw the mother, was said to have cyanosis, failed to cry at birth, and needed to be "helped" for about one-half hour afterward. Three infants had congenital defects: umbilical hernia, inguinal hernia on the right side, and hemangioma on the right groin.

Exposure of Infants to Sunlight.

854 Even during the rainy season sunshine was usually abundant in Bang Chan, but taking a baby out of doors at an early age was generally thought to involve some risk. Many houses had low or wide eaves, and an infant was usually kept in a cradle in the house where sunlight could not penetrate. When old enough to hold up its head while sitting astride an older person's hip, the infant might be carried about the compound by parents or older siblings. As the question was worded ("When did you take the baby outside the house?" or "At what age did you take the baby with you when you went out for pleasure?") the answer did not mean that the baby was taken out with any degree of regularity at the specified age. Most of the babies in this series had been taken outdoors by the time they were 3 months old, but 4 were a year or older when first exposed to [164] sunshine. Nevertheless, the physician found no evidence of rickets among the infants he examined.

One informant, a school teacher's wife, said she thought that taking the baby into the sunshine was not harmful; in fact she believed it made the baby stronger than usual. She thought, however, that too much exposure to sunshine might "bring cold into the baby" and she spoke of the beret as a protection against this.[1] In Bang Chan, an otherwise naked infant might wear a beret when being taken out of doors.

MATERNAL DIET

Diet During Pregnancy.

848 262 Of 31 mothers who furnished some information on diet during pregnancy, 17 were pregnant when interviewed, and the remainder had young infants, in most cases under 3 months of age. Eighteen [125] of the interviews were based on schedule 4 (Appendix p. 53) and provided fairly detailed information on the kinds of foods eaten. Other informants gave more general information, such as foods craved or disliked.

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[171] [1] Wellin (1956) mentioned the small woolen cap made or bought by mothers in the Valley of Ica, Peru, for the infant to wear. The cap was put on soon after birth and was worn, off and on, for many months. The function of the cap was to prevent the entrance of cold via the fontanel, which was defined as a particularly vulnerable point of entry. Wellin noted that all infants he saw in maternity wards in the Valley of Ica wore woolen caps.

Three reported eating eggs daily,[1] and about two-thirds of the 853
women had them either occasionally or frequently. Animal foods 262
other than fish or eggs were eaten infrequently by most nursing
women.

Our questions about ideas concerning foods during lactation did not uncover any firmly established traditional behavior. No food was considered harmful by a majority of informants. In response to the question as to foods which should not be eaten during lactation, however, 12 kinds of food and 4 attributes of food (sour, hot tasting, raw, fermented) were mentioned 27 times. Jackfruit, the item which occurred most frequently, was mentioned 8 times, corn, 3 times, swamp cabbage and pork, twice each; other items such as legumes, beef, poultry, egg, pineapple, and chico, once only. When asked if they disliked any foods at this time 4 women mentioned a dislike for vegetables. One mother said that cooked foods (in contrast to raw ones) were good for a lactating woman. Our question about foods craved during lactation brought little response.

To sum up, the mother's diet during pregnancy and lactation 243
often approximated the usual diet in Bang Chan. A few women
said they craved certain foods during pregnancy and some 853
mentioned foods disliked at that time. A number of food items 262
and attributes of food were considered by some informants to be
undesirable during pregnancy and lactation, but no item was
mentioned so frequently as to be considered tabooed. During [146]
the postpartum rest period, however, a greatly restricted diet
was common. Mothers apparently had no idea of special dietary
needs during pregnancy or lactation.

FEEDING PRACTICES FROM BIRTH TO TWO YEARS OF AGE

This description of feeding practices is based on 256 125
interviews concerning 57 infants and small children. The 953
majority of them were visited from 5 to 7 times each. Since,
insofar as possible, we saw the babies at 3-month intervals,
changes in feeding practices will be described by 3-month
periods or multiples thereof. If each visit to a child is
considered as unity, the 8 age groups from birth to two years
included from 17 to 41 children each with 6 of the age groups
including more than 30 individuals. Thus the data obtained
may be assumed to provide a reasonable picture of baby feeding
practices in Bang Chan, 1952-54, and of significant deviations
therefrom.

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[1] This does not mean that the mother ate a whole egg at one meal. Frequently one or two eggs might be used to prepare food for the entire family.

but additions of rice water, coconut milk, and salt[1] were more common from 3 to 6 months. A few infants less than 6 months old were given rice from the family pot cooked in the usual manner.[2] No other foods were introduced before 6 months of age. 853

A majority of infants from 6 to 8 1/2 months[3] of age were given ordinary rice, although for some, excess water was not drained off and special mashed soupy rice was still given to others. Fishsoy, (4)nam (1)plaa, might be added for both salt and flavor. Several mothers said that when the baby had teeth he could begin to eat ordinary rice. At this time also the infant was given some other items which were considered as adult food (Table 3).^ A few were fed protein-rich foods, i.e. fresh, dried, or salted fish, egg, meat, or poultry, between the sixth and ninth months. One child in this age group was given banana other than (3)kluaj (4)nam-(4)waa (kind not specified), and four infants had fruit other than banana frequently or occasionally. Orange, mango, guava, roseapple, and rambutan were mentioned according to season. Some kinds of (2)kha-(5)nom, which included purchased crackers, biscuits, or cookies as well as some sweet items which we would call desserts,[4] were given also, at least occasionally, to many babies over 8 months of age.

Among infants from 9 to 11 1/2 months of age increasing use of protein-rich foods, primarily fish and egg, was noted. *Fruits other than the small (4)nam-(4)waa banana and (2)kha-(5)nom were also given to more infants. A few were given vegetables before one year of age, but none had them daily (Table 3).

Diet During the Second Year of Life.

For most of these babies breast feeding was continued into the second year. By this time almost all were given ordinary rice, and more than half had fish daily with fresh fish being fed more often than dried or salted fish. A few babies between

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[1] In Thailand rice is not salted during cooking. [263]

[2] See (3)khaaw (5)suaj, glossary p. 51. [152]

[3] The nearest half month marked the dividing point between age groups. Thus an infant 8 months 20 days old would be considered as 8 1/2 months old and one 8 months 23 days old would be considered as 9 months old. [125]

[4] Neither such (2)kha-(5)nom nor fruit were included in the usual family meals, but school children often bought them as snacks to eat at noon recess (Hauck et al., 1958; Hauck and Hanks, 1959). [262]

*[See p. 19 - Analyst] ^[See p. 20 - Analyst]

Fish, fresh, dried, or salted, depending on the family fare, was 855
a regular part of their diet (Tables 9, 10).[4] One had egg daily, 242
and 10, frequently; but for more than half of them egg, as well as meat or poultry, was an occasional item of diet. All were fed (2)kha-(5)nom, and almost half had something in this class of foods daily. Only three had green or other vegetables daily and 5 never ate them. Bananas of the (4)nam-(4)waa variety were eaten by all, but only one had banana daily while more than half had them only occasionally. Four were sometimes given bananas other than (4)nam-(4)waa, the variety which was considered safe for infants and invalids. Two had never had other fruit, but most children of this age were occasionally given other seasonal fruit. The variety of foods other than milk given to these children did not appear to depend on whether or not they had been weaned (Tables 5 - 10).

Weaning.

Some of the children in this series had been weaned before our observations were started, and 19 had not been weaned when last visited. For 30 children the period of observation included weaning (Table 11), and in most cases enough records were obtained so that the effect, if any, of weaning on the weight curve could be ascertained. 862

Table 11. Age at Weaning for 37 Babies and Number for Whom Weight Records Before and After Weaning were Obtained, Bang Chan, 1952-54.

Approximate Age At Weaning	Number of Babies	
	Total	Weighed Before And After Weaning
(months)[1]		
5	1	0
9	1	1
11	1	1
12	8	4
13 - 14	5	5
16 - 17	2	2
18 - 19	8	7
20 - 22	7	6
25	2	2
28	1	1
36	1	1
Total	37	30

[1] Because of the method of choosing children for study, the majority of those observed were under two years of age. We have no basis for judging what proportion of children in Bang Chan were breast fed beyond two years of age. [125]

[4] [see p. 23 - Analyst]

Methods.

All measurements of infants and children were made by one or more members of the research group. Equipment and procedures are described in the Appendix (p. 58). 126

In all, observations were made on 80 babies. For some of these, however, only one or two measurements were obtained. Such records were inadequate for most purposes of this study. Fairly complete sets of measurements were obtained for 71 babies through a total of 449 visits (Table 14).^ Since our aim was to obtain as much information as possible about babies from birth onward, the larger numbers of children were in the lower age ranges. 125

Nine babies were measured once or twice but were not followed longer because of removal from the village, inability of a mentally subnormal mother to cooperate, death (2 cases), and in one instance, reluctance to cooperate on the part of the mother of an illegitimate baby.

The investigation covered a period of 18 months, and visits were made at intervals of about 3 months, thus, most of the children were measured 6 or 7 times (Table 15).

Table 15. Number of Times Children Were Weighed and Measured, Bang Chan, Thailand, 1952-54.

Number of Measurements	Number of Children
3[1]	3
4	2
5[1]	6
6[2]	21
7	36
8	3

[1] An additional measurement of weight but not of height was made on one child.

[2] An additional measurement of weight but not height was made on two children.

Sometimes mother and baby were not at home when the scheduled visit was made. If the household was remote from headquarters it might not be possible to return soon without neglecting other equally urgent work. In other cases the child was visited and the food intake recorded, but the child was unwilling to allow himself to be measured; occasionally the child was

^[see p. 33 - Analyst]

125 asleep, and the mother was reluctant to wake him. Thus, for some children only three or four measurements were obtained.

The measurements of height and weight of each child were tabulated by age in months at observation.[1] A child was considered to be the age at his last month's birthday unless he was within 7 days of the next month's birthday. For example, a child who was measured at 2 months 25 days was considered to be 3 months of age, whereas a child who was measured at 2 months 20 days was considered to be 2 months old at the time of measuring.

Results.

145 Growth in Height and Weight Compared to Children Attending Well Baby Clinics. - The mean, median, and range of height and
125 weight of children measured at 1 month, 3 months, 6 months, 9
141 months of age, and so on, were determined (Tables 16 and 17).^ These figures include data obtained for all children who were measured at any of the selected ages but not weights and measures made at intervening ages. No marked difference was noted between mean and median values for height and weight. At almost all ages the mean and median values for height and weight of boys were greater than those for girls.

For comparison with these observations, only two reports on height and weight of Thai infants have come to our notice. Both of these dealt with infants and young children attending well baby clinics in Bangkok.

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141 Over a period of 5 years, Dr. Montri Mongcolsamai (1939) collected data on height and weight of infants and children who came to the Well Baby Clinic at the Siriraj Hospital. These were described as normal children free from disease and ranging in age from 1 day to 6 years. Most of the children were Thai, most were from Bangkok, and most had been born in the Siriraj Hospital. In all, 2664 children were observed; 3006 measurements of height and 3570 measurements of weight were obtained.

Dr. Montri (1939) grouped the data according to age and sex, reporting mean values for height and weight of children under 1 year of age at monthly intervals and of children over 1 year of age at intervals of 6 months. For example, weights of all male infants who were 1 month old but younger than 2 months were averaged, also, weights of all male children who were 1 year old but younger than 1 1/2 years were averaged. Average weights and lengths of newborn infants and of infants under 1 month of age were included.

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[1] The height and weight of each child at each observation were reported by Smith (1958).

^ [see p. 36-37 - Analyst]

In some age groups fairly large numbers of children were observed and in other groups relatively few. None of the groups up to 4 1/2 years of age with whom the children in this series could be compared included fewer than 30 individuals. The numbers of boys and girls measured at each age were about the same. 145 125 141

Dr. Amara Chandrapanond (1957) reported the mean heights and weights of 20 babies who were weighed and measured at monthly intervals over a period of a year. She did not report values for boys and girls separately, but, in general, at each age these fell between those for males and females as reported by Dr. Montri (1939). 145 141

In figure 1[4] the median heights of boys and girls in Bang Chan together with the number of individuals who were measured at 3, 6, 9, 12, 15, 18, or 21 months are shown in comparison to the height curves constructed from values reported by Dr. Montri (1939). Corresponding median weights are shown in figure 2.[5] Although the groups are small, the tendency for both height and weight of young children in Bang Chan to be below that of children attending a well baby clinic in Bangkok is clear.

One should note, however, that Dr. Montri characterized the children he observed as "free from disease", whereas some of the children of Bang Chan had colds, skin infections, or other minor disorders which might have affected their weights. Such disorders are very common, and we do not know whether or not they disqualified children attending the Well Baby Clinic from inclusion in the series for which heights and weights were reported. [164]

Graphs of height-age and weight-age were plotted for each child in this study and for small groups of children who were observed regularly over a year or so at the same ages. [128]

Most of the children increased in height in a fairly regular fashion, the slopes of their height curves being about the same as the curve drawn from Dr. Montri's[1] values, although there were individual variations in this. The height curves of many more children of Bang Chan were below than were above the curve drawn to Dr. Montri's values. Of the 35 girls measured, the height curves of 6 were above, 6 were about the same as, and 23 were below the curve drawn to Dr. Montri's values for girls. Of the 36 boys measured, the height curves of 9 were

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1. Mean values reported by Dr. Montri were plotted at 1-month intervals for the first 11 months, then at the midpoint of the intervals he reported. For example, measurements reported for children 1 to 1 1/2 years of age were plotted at 1 year 3 months.

[TEXT CONTINUED ON PAGE 41.]

4 [see p.34 - Analyst; 5 [see p.40 - Analyst]

145 141 above, 12 were about the same as, and 15 were below the curve drawn to Dr. Montri's values for boys.

[125] Mean heights and weights of groups of children who were observed regularly at 3-month intervals, at the same ages, were determined. The numbers in these groups were small because of difficulties encountered in collecting data precisely according to plan, but curves could be constructed for some such groups covering periods up to 12 months. These were compared to those based on Dr. Montri's values. The curves of mean height for such small groups were fairly smooth with slopes similar to but below the curve drawn to Dr. Montri's data.

For the younger groups of children in Bang Chan, curves for mean weights were generally below those drawn to Dr. Montri's values. Although the groups under 1 year of age were, on the average, about 1 week younger than the children observed by Dr. Montri, adjustment[1] did not eradicate the difference. Differences between mean weights for groups of children 15 months of age and older, in this series and in Dr. Montri's, were less consistent than for the younger children.

145 Many studies on weight of infants in the tropics indicate that weight gain during the first 6 months or so of life is comparable to that of infants in Europe and America. After 6 months of age, however, the weight curves become flattened (Jelliffe, 1955; Falkner et al., 1958). Both Dr. Montri (1939) and Dr. Amara (1957) noted this tendency in the weights of the Thai infants they studied. Dr. Montri (1939) compared the weights of the Thai children he observed with values reported for Japanese children. He found that up to 6 months of age Thai children weighed as much as Japanese children but that after this age they weighed less. Dr. Amara (1957) compared the weights of the infants she observed with those of American babies and found that after 4 months of age the Thai infants gained weight more slowly. Both of these observers expressed the opinion that Thai babies gained weight more slowly as they grew older because their diets were inadequate.

145 141 In general, Thai children are short and light as compared to children in the U.S.A. In the Bang Chan group, for example, at 3 and 6 months the median weights for male infants approximated the 25th percentile of male infants as reported by Stuart and Stevenson (1950). At 9 months, however, the median weight was

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[1] Dr. Montri calculated that boys 3 to 6 months old gained, on the average, 23 grams per day and that girls gained 22 grams per day; from 6 to 9 months the figures are 7.3 and 7.8; and from 9 to 12 months they are 7.4 and 7.6 grams, for boys and girls respectively. These values were calculated for a week and added to the mean weights of the children of Bang Chan to find out if the difference could be accounted for in this way.

clear evidence of a seasonal effect. If weight gain in Thai 145
infants is related to season, this could be better defined by
weighing groups of children at monthly intervals and determining
when or if changes in rate of gain occur.

Although our records were not made for the purpose of 145
correlating food intake with weight gain, and no quantitative 262
information was obtained on the diets of mothers and babies, we [125]
attempted to see if any obvious relation existed between the
variety of food eaten by the mother or the child and the child's
growth. For this purpose, case studies were made of 7 infants
whose records from birth onward were fairly complete. The age
at last observation was from about 14 to 18 months. Four of
these children had gained at each weighing and weighed more at
one year of age than the average infant observed by Dr. Montri
(1939). Three were chosen because they had lost weight or
failed to gain at some time during the period of observation
and weighed less at one year of age than the average infant
observed by Dr. Montri. Infants of both sexes were included in
each group. No illnesses or abnormalities were recorded in
the clinical histories of any of these babies or their mothers.
No evidence was obtained from the qualitative food records as
to why some infants gained consistently and at a fairly "normal"
rate, whereas others gained relatively slowly and failed to
gain or lost weight at times (Smith, 1958).

Quantitative food records might have provided evidence on
this point but our observations were inadequate for this purpose.
Such quantitative records should include estimations of the
amount of mother's milk obtained by the infants, based on the
baby's weight before and after nursing, as well as records of
supplementary food given. Analysis of the mother's milk, particularly for the content of the water soluble vitamins which
are influenced by the mother's diet, should also help to shed
light on the cause or causes of the common failure to gain weight
among older infants and small children in Bang Chan. No cases [164]
of beriberi occurred among the infants we observed, but in two [165]
instances siblings had died of infantile beriberi.

Evidence of protein malnutrition has not been commonly 121
recognized in rice eating areas, but one must consider the
possibility that these children may be in a state analagous to
pre-kwashiorkor. Development of the clinically recognizable
protein deficiency disease may be forestalled when the child
learned to feed himself and eats more liberally of rice with
some fish and egg. Of the 54 children with kwashiorkor [862]
observed by Netrasiri and Netrasiri (1955) in Bangkok, many [171]
were weaned earlier than was usual in Bang Chan. Most of them,
however, had been breast fed, and 4 were still being breast
fed when the disease was diagnosed.

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SCHEDULE FOR INFORMATION CONCERNING MOTHERS IN BANG CHAN.[1]

Cornell University Thailand Project 1952-53 Schedule 4

No. for child
Date

1. Hamlet............House No..... 2. Name 1)..................

2)............3. Husband's Name 1)............ 2)...........

4. Married........years 5. Present pregnancy............ months

6. Pregnancy, illness during:

7. Objective signs of deficiency:

8. History of:
   a. Malaria........ c. Tuberculosis...........
   b. Beriberi....... d. Other disease.......

Post partum interview, date...................

9. Delivery:
   a. Date.................. c. Type..................
   b. Where................ d. Confined by...........

10. (2)juu (1)faj:
   a. No.....Yes..... e. Hot ashes chamber......
   b. Days rest...... f. Other...................
   Kind: c. Fire............
   d. Hot water bottle........ g. Activity..............
   h. Bathing...............

11. Medicine used by mother:
   a..........................
   b. With liquor: Yes.....No.....

12. Water: a. Rain....... d. Boiled....... f. Hot.......
   b. Canal....... e. Raw.......... g. Cold......
   c. Fish pond.......

13. Milk stimulation: How....................................

14. Colostrum:.................... 15. Complaints:...........

16. Objective signs of deficiency:............................

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[1] Information obtained from pregnant women and those with infants under one year of age.

Schedule 4 contd.

FOOD HABITS OF MOTHER	Date	Pregnancy A				Postpartum B				Lactatio C			
		D	F	O	N	D	F	O	N	D	F	O	N
17. Rice	a.(3)khaaw (5)suaj[1]												
	b.(3)khaaw (1)caan (4)naam[1]												
	c.(3)khaaw (3)tom[1]												
18.Fish	a.Fresh												
	b.Dried												
	c.Salted												
19.Egg													
20.Poultry													
21.Meat	a.Pork												
	b.Dry beef												
	c.Fresh beef												
22.Vegetables													
	a.Green												
	b.Other												
23.Fruits													
	a.Bananas												
	b.Coconut												
	c.Other												
24.Legumes													
	a.Dry beans, peas												
	b.Peanuts												
25.Other foods													

26. Foods craved			
27. Foods disliked			
28. Believed to be good for:			
29. Believed to be bad during:			
30. Relation to usual diet:			

D - Daily, F - Frequently, O - Occasionally, N - Never

Interview by..
Informants..

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[1] See Glossary of Thai Terms (p. 51).

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Schedule 4 contd.

SUPPLEMENT TO SCHEDULE 4[1]

31. Age.............years

32. Menstruation: a. Regularity: Yes.......No.......
b. Duration:.......... days
c. Interval:.......... days
d. Menarche:.......... years
e. Menopause:......... years

33. Children: a. Total...................
b. Alive....... Dead.......
c. Stillbirths.............
d. Other: (State which child, age, cause)
....
....
....
....
e. Miscarriages........
Age: f. Oldest............ years
Youngest.......... years

34. Position in series of the children in this family whose dietary histories were obtained:........................

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[1] This information was obtained from all adolescent girls and women examined in the random sample of village households, as well as from each mother who gave us fairly complete information concerning the dietary history of one or more children.

SCHEDULE FOR INFORMATION CONCERNING BABIES IN BANG CHAN.[1]

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Cornell University Thailand Project 1952-53 Schedule 5

No. for child
Date

1. Hamlet..............House No..... 2. Name 1)..................

2)...................... 3. Sex M F 4. Birth date..........

5. Mother's name 1)................ 2)................ 6. Father's

name 1)................ 2) ....

7. Complications of delivery.................................

8. Condition at birth..

9. Eye prophylaxis...

10. Condition after birth:
    a. Convulsions....... d. Fever.....
    b. Vomiting.......... e. Other.....
    c. Diarrhea..........

11. Smallpox Vaccination:
    a. Yes.....No.....
    b. Age.............
    c. Result.........

12. Physician's comments on first examination:

13. Early treatment of baby:
    a. Medicine........................
    b. Food and water..................
    c. Put to breast: (Day and times)
    1st.......2nd.......3rd.......
    4th.......5th.......

14. Cradle, ventilated: Yes.......No.......

15. Cultural customs:
    a. Offered to spirit: Yes...No...
    b. By.............................
    c. Items on tray..................
    d. Head shaved....................
    e. Age............................
    f. By.............................
    g. Ceremony: Yes.....No.....

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[1] Items 7 - 15 used for all infants under 1 year, items 16 - 36 for all children up to 3 years of age at first interview.

Schedule 5 contd.

125 FEEDING OF BABY

Date of Interview	A				B				C				D			
16. Age																
17. Length, cm.																
18. Weight, kg.																
Food	D	F	O	N	D	F	O	N	D	F	O	N	D	F	O	N
19. Mother's milk																
20. Cow's Milk[1]																
21. Water a. Boiled																
b. Rain																
c. Canal																
22. Rice a. (3)khaaw (3)tom[2]																
b. (3)khaaw (2)piag[2]																
c. (3)khaaw (5)suai[2]																
23. Banana a. (4)nam-(4)waa[2]																
b. Other																
c. Crushed																
d. Baked																
e. With Rice																
24. Vegetable a. Green																
b. Other																
25. Fish a. Fresh																
b. Dried																
c. Salted																
26. Egg																
27. Poultry																
28. Meat																
29. Other fruit																
30. (2)Kha-(5)nom																
31. Exposure to sunlight																
32. Good for baby																
33. Not good for baby																
34. Teaching baby to eat																
35. Weaning procedure																
36. Age at which baby eats adult food					37.Circumcision 38.Age											

D - Daily, F - Frequently, O - Occasionally, N - Never

Interviewed by ....

Informants..

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[1] Write in brand and notes on type of milk

[2] See Glossary of Thai Terms (p. 51)

GUIDES FOR THE INTERVIEWER AND DESCRIPTION OF ITEMS IN SCHEDULES

General Guides for Interviewer.

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Schedule 4 was designed so that one form might be used to record all relevant information concerning the mother before and after the birth of a given child.

Schedule 5 was designed so that one form might be used to record all available relevant information concerning each child's history from birth onward.

At the initial interview the informant should be asked first about the situation at that time. For example, if the mother has a baby 6 months old, she should be asked about the child's food intake at that time, then what he was fed at an earlier age, for example 1 or 2 months, and finally the questions relating to the baby's birth and first few days of life. Similarly, the mother should be asked first to tell about her own present diet (in this case recorded under Food Habits during Lactation on Schedule 4) then concerning her care and diet at delivery and in the early postpartum period, and finally information concerning her health and food habits during the pregnancy which resulted in this baby.

Ideally, one would have the first interview during pregnancy and follow with records of interviews obtained periodically after the birth of the baby. To gain an idea of the present situation and practices in the village more rapidly, however, parents of infants under one year of age should be asked to furnish information about the infant's earlier history, including the mother's diet and condition prenatally.

The date of interview, in relation to the date of birth, indicates whether a given series of answers relate to the situation at the time of interview, or to an earlier situation, described from recall.

Schedules 4 and 5 relating to a given infant should be identified by the same Roman numeral, as I, in the upper right hand corner. Schedules 5, relating to other children under 3 years of age, from the same mother, should be identified as II, III, etc. An example follows showing information to be obtained at each of 3 interviews with the same mother when the first interview is held during pregnancy and she has two older children under 3 years of age.

EXAMPLE:

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	Mother Schedule 4	Baby Schedule 5, I	Child Schedule 5, II	Child Schedule 5, III
At First Interview:	6½ months pregnant	unborn	15 months	30 months
check items:	1-8 and 17-30A	———	1-6, 11-12 16-34A (35-39)[1]	1-6, 11-12 16-34A (35-38)[1]
At Second Interview: 3 mo. later	Post-partum	2 weeks	18 months	33 months
check items:	9-16, 17-30B	1-15, 16-33A	16-34B (35-38)[1]	16-34B (35-38)[1]
At Third Interview:	Mature lactation	4½ months	22 months	37 months
check items:	17-30C	16-34B (37-38)[1]	16-34C (35-38)[1]	No schedule. Weigh and measure only.

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[1] Use when appropriate.

Description of Items on Schedule 4.

Date. The date of first interview was entered on line 1.

1-3. Identification. Name of woman, name of husband, and their residence.

4. Years of marriage. To avoid embarrassement in cases where there had been no legal ceremony, the question was phrased to mean "How long have you had a house?"[1]

5. Present pregnancy. The woman's own estimate of the duration of the present pregnancy in months.

6. Pregnancy, illness during. The physician asked questions,[1] recorded description of symptoms, and commented on nature of illness.

7. Objective signs of deficiency. If the woman's complaints suggested dietary deficiency, the physician examined the patient for objective signs such as absence of knee jerk, changes in hair, skin, eyes, lips, tongue, gums, etc. and recorded his findings or dictated them to the recorder.

8. History of malaria, beriberi, tuberculosis and other disease. The physician asked questions which would lead the patient to describe past illnesses. Advanced symptoms of the diseases listed are sufficiently marked and characteristic to permit the patient to describe them so that the physician would recognize them with reasonable certainty. Furthermore they have a direct bearing on the nutritional history. Under "other disease" such items as chronic diarrhea and symptoms of diabetes were entered.

Postpartum interview, date. If the first interview was obtained during pregnancy, this date was different from the one above. If the first interview was after the birth of the child, this date was the same as the one above. From this date and the date of delivery, one can tell whether the information obtained was recent or recalled, and if recalled, from what time in the past.

9. Delivery.

a. Date. If the delivery was very recent the recorder could ascertain the day of birth (as last Friday) and record it at once according to the western calendar. Otherwise, the date according to the Thai calendar was recorded, and this was later translated.

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[1] The investigator decided on an appropriate way to phrase each question and used the same words consistently.

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b. Where. This was designated as "home", "Mother's home", "midwife's home", etc.

c. Type.- Anything unusual about the delivery was noted; otherwise it was considered normal.

d. Confined by. If a local midwife attended the mother, the midwife's name was given here. If a nurse, midwife, or physician from outside the village attended the mother, this fact was noted.

10. (2)Juu (1)faj.

a., c., d., e., f. The custom of having the mother rest for a number of days in front of a fire is an old one in Thailand. If the mother was visited while she was still resting, the wood fire, if used, was in evidence. If not, the mother was asked if she was using a hot water bottle, hot ashes chamber, or other heating device. From experience one infers that those who do not actually have a wood fire but who used a hot water bottle or hot ashes chamber may reply either "no" or "yes" to the question apparently depending on their attitude toward the practice. If they considered it a good custom, but inconvenient, or if they were hesitant to break with tradition, they might regard the hot ashes chamber or hot water bottle as a modern form of (2)juu (1)faj and therefore reply "yes". If, however, the mother considered the practice of (2)juu (1)faj old fashioned, she might reply "no", yet be using a hot ashes chamber.

b. Days rest. The number of days of comparative rest was recorded. If the mother observed (2)juu (1)faj, this was the same as the days (2)juu (1)faj.

g. Activity. This item was included because of some concern on the part of the instructor in midwifery at the Maternal and Child Health Center in Bangkok because some mothers were relatively inactive, lying on a board before the fire for a number of days. If the mother sat up, went to the latrine, or got off her bed to get things for herself, this item was checked.

h. Bathing. Some mothers did not bathe but had their bodies rubbed with tumeric. This item, suggested by the midwife at the Maternal and Child Health Center in Bangkok, was included to see whether or not there was any general feeling that the mother should not be bathed.

11. Medicine. In our preliminary interviews we learned that mothers often took medicine after childbirth and that frequently this was mixed with liquor. This item was included to learn which medicines were most commonly used and the extent of the practice of taking medicine with liquor at this time.

12. Water. Contaminated water is a possible source of disease in Bang Chan. This item was included because we learned from preliminary interviews that during the (2)juu (1)faj period special precautions might be taken with respect to the source, treatment, and temperature of water consumed by the mother and baby.

13. **Milk stimulation**. **How**. In our early interviews we encountered several cases in which we were told that the child 125 was not put to the breast because the mother had no milk. 124 Medicine, local applications to the breast, and certain foods reputed to stimulate milk flow were all used. We wished to know what, if anything, was done with the idea of milk stimulation specifically in mind.

14. **Colostrum**. In our early interviews we encountered some cases in which the first mammary secretion was considered unsuitable for the child. It was expressed and discarded. Any ideas as to whether or not colostrum was good for the baby were entered here.

15. **Complaints**. The physician asked "Now, how do you feel?".

16. **Objective signs of deficiency.** Same as item 7, except that this question related to the post partum period.

Food Habits. The date of interview was entered in the appropriate space, A, B, and/or C. These dates might all be different if the first interview occurred during pregnancy, or they might be all the same if the interview were held during lactation and information concerning food habits during pregnancy and postpartum obtained by recall. Items 17-25 included the categories of food which were noted in the dietary records obtained in 1948-49 (Sharp et al.,1953), grouped roughly according to nutritive value. Frequency with which a given type of food was eaten was indicated by checks in columns labeled: D (daily), F (frequently, i.e. not every day, but at least every week), O (occasionally, i.e. at relatively long intervals) and N (never). Items in these latter categories might be so placed because they must be purchased and were relatively expensive, or because the individual did not like the food. In the latter case, the recorder wrote in D for "dislike" following the item. Note that item 27, **Foods disliked**, refers to aversion to a given type of food at this period but not always.

17. **Rice**. See Glossary, p. 51, for description of these preparations.

18. **Fish**.
   a. **Fresh**
   b. **Dried**
   c. **Salted**

These three categories were included since in preliminary interviews we found that at some times one form might be used to the exclusion of the others; also, salted fish is used in very small amounts. Thus if salted fish only were used during (2)juu (1)faj, this category would be checked. If, however, fish was eaten daily but the fish might be sometimes fresh, sometimes dried, or sometimes salted, the appropriate categories were bracketed together under the appropriate column and one check mark entered.

125 19. Egg.

124 20. Poultry.

Most farmers in Bang Chan raised poultry, but in many households most of the eggs produced were sold. We wished to know whether these foods, though a cash crop, were used by mothers.

21. Meat

a. Pork. Few farmers in Bang Chan raised hogs. Pork, if eaten, was generally purchased.

b. Beef, dry.

c. Beef, fresh

In Bang Chan "beef" usually meant water buffalo meat. If an animal died, some of the meat might be consumed fresh and the rest dried for future use.

22. Vegetables.

a. Green. In this category were included the green leafy vegetables such as swamp cabbage but not items such as green egg plant which although green on the outside are not rich in carotene.

b. Other. All vegetables other than the green leafy ones were included in this category.

23. Fruit.

a. Bananas. Since they were grown by all farmers in Bang Chan, were placed in a separate category.

b. Coconut. Was used frequently in the form of coconut milk and coconut cream in food preparation. Since coconut was one of the chief sources of fat in this area, it was put in a separate category.

c. Other. If other fruit was eaten daily or frequently, the kind of fruit was entered under the appropriate column.

24. Legumes.

a. Dry beans, peas.

b. Peanuts.

Although, according to the records obtained in 1948-49, (Sharp et al., 1953) dry legumes were seldom used in Bang Chan, increased use of legumes had been suggested as a means of increasing both protein and thiamine in the Thai diet. We had also observed dry beans of several varieties for sale in the village, and we wished to get some idea as to the extent to which they were used.

25. Other foods. The most frequently mentioned "other foods" were sweets. 125
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The interviewer usually began by asking "what foods do you eat?" or "During pregnancy what did you eat?". After the informant had replied, he would ask about specific food categories not mentioned by the informant to be sure they had not been forgotten, then would sum up the information before going on to the next question.

26. Foods craved.

27. Foods disliked.

28. Foods believed to be good for.

29. Foods believed to be bad during.

Items 26-29 were included to get information on beliefs and reactions toward specific types of food during pregnancy, the postpartum period, or lactation. Such ideas might either favor or hinder the introduction of any changes in diet which might be considered desirable.

30. Relation to usual diet. The interviewer asked how the diet at this time compared to the mother's usual diet.[1] The reply was usually entered as "same" or "restricted." If "restricted", items listed under 29 "believed to be bad during" indicated changes from the usual.

Initials of the interviewer and recorder were entered under the appropriate column (as pregnancy, postpartum) and the name(s) of the principal informant(s) entered below.

At the conclusion of the interview the recorder rechecked the schedule to see that all appropriate spaces had been filled. To indicate that a question was asked or an examination made but the answer or results were negative, a zero was entered. Thus if the mother said she had not been ill during pregnancy, a zero was entered after item 6. If the physician examined for objective signs of deficiency but found none, a zero was entered after item 7 (for pregnancy) or after item 16 (postpartum).

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[1] The investigator decided on an appropriate way to phrase each question and used the same words consistently.

Description of Items on Schedule 5.

1-6. Identification. (Same as for schedule 4).

7. Complications of delivery. The physician asked "Was it easy to deliver?"[1]

8. Condition at birth. "How about the condition of the baby after delivery?"[1]

9. Eye prophylaxis. "Were drops put in his eyes early?"[1]

10. Condition after birth.

a. Convulsions. "Did the baby have convulsions soon after delivery?"[1]
b. Vomiting.
c. Diarrhea.
d. Fever.
e. Other.

Symptoms, especially those associated with or which might lead to nutritional disorders in young infants, were listed so that answers might usually be recorded by a check mark, if the symptom was present, or a zero, if absent. Small spaces were left for writing in comments, if necessary, as well as a space for occurrence of other symptoms in the infant.

11. Smallpox vaccination.
a. "Has the baby been vaccinated?"[1]
b. "What was the age of vaccination?"[1]
c. "Was it successful?"[1]

12. Physician's comments on first examination. If the interview was held within a few days after birth, the physician's comments on the condition of the baby were written here. In practice, comments were recorded only when the baby appeared to depart from the normal in some significant way.

13. Early treatment of baby.

a. Medicine. If the new born baby was given medicine, either purchased or prepared at home or by the midwife, the nature of the medicine was noted.

b. Food and water. Here the recorder noted the kind of food, if any, which was offered before lactation was established; also the source and treatment of water given as "boiled rain water", "boiled canal water", etc.

c. Put to breast. (day and times). The physician asked when the mother began to breast-feed her infant. If she said this was on the 3rd, 4th, or 5th day after the baby was born and that she did not let him suck at all until she had milk, a check in the appropriate blank was used to answer the question. If, however, the baby was put to the breast before the milk flow was established,the number of times this was done was entered in the appropriate space. Thus, a mother might put the baby to the breast once on the second day and frequently on the 3rd or 4th days.

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[1] The investigator decided on an appropriate way to phrase each question and used the same words consistently.

14. Cradle, ventilated. A number of different types of cradles are found in Bang Chan, i.e. those woven of fiber, those made of wood with slatted sides, those with a wooden frame and string side, and those of cloth. If the cradle was in evidence the recorder checked yes or no according to whether or not it allowed fairly good circulation of air about the baby.

15. Cultural Customs.

a. Offered to spirit. The custom of offering the baby to the spirits was noted during the 1948-49 study. This item was included to find out how common this practice was in Bang Chan.

b. By. The name, or relationship, of person offering the child to the spirit was noted here.

c. Items on tray. If the child was offered to the spirits, it was customarily put into a winnowing tray together with various items which were supposed to influence its progress and well-being in later life. For example a pencil, exercise book, needle and thread (for a girl) were frequently placed on the tray. The tapered bamboo used by the midwife to cut the cord, and the clod of earth or the rhizome on which the cord was laid at the time of cutting, were also put on the tray.

If the interview was carried out at the time when the baby was on the tray, interviewers noted and recorded items actually on the tray with the baby. If the interview was carried out at a later date, the interviewers asked what was placed on the tray. Should the informant fail to mention any of the common items used, the interviewer asked about these specifically, i.e. "Did you put a pencil on the tray?", "an exercise book?" to be sure that the informant had not forgotten to mention the item. Comments of interest made by informants with respect to this custom were recorded here if there was space; otherwise they were noted in the interviewer's notebook.

d. Head shaved. This was usually done at about one month of age. Concerning infants this age or older the interviewer asked about the head shaving (which might be obvious). If the head had been shaved, the age at which this was done, by whom, and whether or not there was any attendant ceremony were recorded.

On the lower half of schedule 5 were spaces for recording 4 interviews (A, B, C, and D) concerning the child's feeding, together with information on age, length, and weight on the date of each interview.

125 16. *Age*. Age was obtained from the birth date (item 4)
124 and was figured by a member of the team according to the western system.

17. *Length or height in cm*. Height was measured on a locally made wooden measuring device hinged so as to fold (4 sections, each 50 centimeters long) and provided with a sliding set square. Divisions on the scale were burned into the wood. An infant was measured by putting the device on the floor and placing the baby on it. The knees were pressed down so that the backs of the knees were in contact with the scale. One of the research group then placed a flat-surfaced object such as a book perpendicular to the scale against the soles of the feet, while another brought the set square in contact with the infant's head. The readings at both feet and head were recorded and one was subtracted from the other to determine the length of the baby.

Measurements of babies are less exact than for older children, since babies often squirm and struggle during the measuring procedure.

18. *Weight*. Babies were usually weighed on a scale with a capacity of 15 kilograms in 50 gram divisions. The baby was placed on a pillow or cloth on the platform of the scale and the weight recorded. The pillow or cloth and any garments which had been on the baby were then weighed and this weight recorded. The second weight was subtracted from the first to obtain the weight of the baby.

During the dry season, when boat travel was not possible and visits to the households had to be made on foot, only a bathroom scale was carried. An infant was weighed in the arms of an adult, and the weight of the adult subtracted from the total. Divisions on this scale represented one-half kilogram, but values could be interpolated to one-fourth kilogram. No very young infants had to be weighed on this less exact scale.

The weight of the babies and young children can be considered as approximate only. No attempt could be made to weigh the baby just before a feeding or just after excretions had occurred as could be done with older children. The observed weight of an infant or young child at any given time is affected by variations in these conditions. Nevertheless, the recorded figures gave a reasonable idea of the size of Bang Chan infants at various ages, and the rate of growth of an individual child.

Food eaten by the child was recorded by checking the appropriate column, D (daily), F (frequently, i.e. not every day, but at least every week), O (occasionally, i.e. at relatively long intervals) and N (never). If the informant volunteered that a given food was never eaten or only occasionally eaten because the child disliked or refused it, this information was noted.

19. *Mother's milk*.

20. *Cow's milk*. If cow's milk was being fed to the baby, the brand and type of milk (as Bear brand condensed, Bear brand dried, etc.) was written in the space allotted to the interview together with a check indicating frequency of use.

21. *Water*.

a. *Boiled*. If the baby was given boiled water daily or sometimes, the appropriate column D, F, or O was checked. If raw water was used, this item was checked N (never).

b. *Rain*.

c. *Canal*. Items b and c indicated the source of the water which might be used either raw or boiled as noted under a.

22. *Rice*. See glossary, p. 51, for description of these preparations.

23. *Banana*.

a. Since (3)kluaj (4)*nam*-(4)*waa* is a type of banana frequently used for baby feeding this was named specifically.

b. *Other*. The name of any other types of bananas used was entered in the appropriate column, with a check indicating frequency. Thus, if on second interview the interviewer learned the (3)kluaj (5)hauaum were given occasionally, "hauaum" was written in the *B* column opposite "other" and a check entered under "O".

c. *Crushed*.

d. *Baked*.

e. *With Rice*. Items 23, c, d, and e represented ways in which bananas were frequently prepared for infant feeding. If the interviewer learned that other methods were used, these were described separately in the field notes with a marginal footnote on schedule 5 to call attention to this.

24. *Vegetables*.

a. *Green*. In this category were included the green leafy vegetables such as swamp cabbage but not items such as green egg plant which, though green on the outside, are not rich in carotene.

b. *Other*. All vegetables other than the green leafy ones were included in this category.

25. *Fish*.

a. *Fresh*.

b. *Dried*.

c. *Salted*.

125 124 These three categories were included since in preliminary interviews we found that one form might be considered appropriate and another inappropriate for a child of a given age. Thus, if fresh fish were given daily or frequently but dried or salted fish were never given the child, this could be recorded. If, however, the child were given any type of fish which was prepared for the family, the appropriate categories are bracketed under the column in which the interview was being recorded and a check entered to indicate frequency.

26. Egg.

27. Poultry.

Most farmers in Bang Chan raised poultry but in some cases most of the eggs produced were sold. We wished to know whether these foods, though a cash crop, were used in baby feeding.

28. Meat. If meat was fed to the baby, the type, as pork, dry beef, fresh beef, was indicated under the appropriate column.

29. Other fruit. Two spaces were left for fruit so that if fruits other than bananas were given to the baby with any degree of frequency, the name(s) of the fruit(s) might be entered.

30. (2)kha-(5)nom. This term, used rather generally for sweets, crackers, etc.,was included as a category since we learned in our preliminary interviews that some parents gave (2)kha-(5)nom to children at a fairly early age. Two spaces were allowed so that the names of (2)kha-(5)nom commonly given to a child might be entered.

31. Exposure to sunlight. Several considerations led to inclusion of this item.

a. The teacher of midwifery at the Maternal and Child Health Center in Bangkok told us that some Thai mothers whom she had observed tended to put the child in direct sunlight facing the sun. She believed this to be bad for the baby's eyes and also to cause the baby to perspire overmuch. Mothers might then wipe perspiration off the baby with soiled cloths. She believed this to be a factor in the skin infections seen in babies.

b. The reported high incidence of bow legs among children in the Bang Chan primary school and elsewhere in Thailand, which Dr. Yong (1939) attributed to unsuitable diet for infants and small children and to the practice of encouraging babies to stand and walk prematurely, might also be related to inadequacy of vitamin D. In Bang Chan, many houses had low hanging eaves which permitted little access to sunshine unless the baby was taken outside the house.

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32. Foods good for baby.

33. Foods not good for baby.

Items 32 and 33 were included to get information on beliefs and reactions toward specific types of food during infancy and early childhood. Such ideas might either favor or hinder the introduction of any changes in diet which might be considered desirable.

34. Teaching baby to eat. Techniques used in introducing new foods into the child's diet were entered here or reference made to more complete writeup in the interviewer's notes.

35. Weaning procedure. When a young child (under 3 years old) had been weaned, the informant was asked how the weaning was accomplished. Age at weaning was also entered here.

36. Age at which baby eats adult food. This was interpreted to mean that the child eats all types of food which adults in the family eat.

37 and 38. Circumcision. This question was later found to be inappropriate for this age group. In Bang Chan, Moslem boys were circumcised at about 11 years of age.

Initials of interviewer and recorder were entered in the appropriate place on the line marked "interviewed by", and the name(s) of the principal informant(s) entered below.

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[For general information on the Sentence Completion Test used by the author in this field study, with examples of the types of questions employed, see category 116, pp. 8, 86-87, 100, 109-138, and 142-199.]

596 As the reader might by now suspect, it is not easy to determine the basis
*156 of the unity of the family. However, of all the factors that keep people living together in amity and affection, two come to the fore: a sense of love, obligation, and respect that is derived from the simple fact of kinship, but which must be continuously confirmed by mutual benefits; and economic considerations.

596 The economic foundation of the family is significant not only because
476 the family is in fact the sole economic and occupational unit in the community (with the exception of the monkhood and school) but because the villagers themselves think of the family in terms of its economic
[581] functions. People say that they marry for wealth or because of the productive capacities of their spouses;[13] spouses stay together because the eco-
[593] nomic costs of a split are too great; most important of all, people are keenly *aware* of their economic interdependence. Fathers say that they need children to work in the fields and care for the buffalos, that a family needs a mother so that its members will be fed, that siblings are useful because it is easy to borrow from them (although, as noted earlier, some are unhappy about the intrusion of the kinship tie into what they regard to be a commercial transaction). Many villagers extend this economic, transactional type of thinking to other aspects of the kinship relationship. Thus
[581] they say that "the purpose of marriage is to have a companion who will take
[593] care of you when you get sick," or very frequently that "my parents went to the trouble of bringing me up so they would have a person to make merit for them when they die." The emphasis here is on independent agents serving each other because it is mutually beneficial.

*156 The love and affection that people feel for each other is of course
181 grounded in the close associations that one finds in most nuclear families.
171 However, the attitudes of respect that one sees are perhaps more distinc-
571 tively Thai. Almost all the literature on Thailand refers, at one point or another, to the patterns of respect (*khwaamnabthyy*) existing between people, both within and without the family. These patterns are based, in the first instance, on the status inequalities that exist in almost all social

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[125] [13] In responding to the unstructured Sentence Completion Test item, *"He (she) wants to get a wife (husband) who. . . ,"* for example, thirty-one of sixty informants indicated that they wanted a mate who "was a good worker," "earned a living," "was rich," or otherwise had high socio-economic status. Only two persons said that they wanted a spouse for reasons that could be reasonably defined as sentimental: one woman wanted a husband who "would be a good friend with whom she could discuss things," and a man said he wanted a wife whom "he loved." Other informants gave completions distributed among a variety of categories: "polite, well-mannered, handsome, kind, strong, and good" spouses; and six women wanted husbands who would be faithful.

the parents often do not really care and children can pretty much get away with doing what they want.[14] 861 [155]

With regard to other expressions of the recognition of individual dignity, one rarely sees in Bang Chan any physical or even verbal coercion. (The rare use of whipping, noted above, is to punish transgression, not to implement action.) Other than in horseplay, children do not push each other around; in my twenty-two months in Thailand, I saw not one case of young children in a serious fight, despite the fact that I looked for it. Very rare indeed is the parent who uses force or the threat of force on his child; there is no Siamese equivalent to the American intimidation, "You had better do that or else. . . ." In general, Bang Chaners proceed on the simple assumption that if people, including children, do not do what you ask them, they have good—and more important, private—reasons for responding that way; there is no need for, or interest in, self-justification. The major means of inducing recalcitrants to conform to your wishes is to cajole, wheedle, and flatter them (see particularly the responses to the Sentence Completion items, "*The best way to treat a subordinate is . . .*"; "*The worst way to treat a subordinate is . . .*" in chapter V). A less conscious but more frequently practiced alternative is simply to withdraw support: the parent who turns his back on the child and walks out (particularly evident in our TAT stories),[15] the older sibling who refuses to take his younger ones with him when there is entertainment to be seen, and the like. It must be noted, however, that social disengagement, although frequently utilized, does not always work; often the individual who is left suspended merely accepts the fact and continues about his business. The major point to be recognized is that villagers do not use forms of direct, blatant coercion on others. If soft words or the withdrawal of love will not move them, then their decision, freely determined, must be respected. [865] 861 155 156* [125] • [125]

Love and affection within the family appear primarily in two forms. Their most typical expression is shown through the gifts, favors, and services people do for each other. The degree of affection that individuals feel toward one another is in fact explicitly measured in these terms. Thus, a father says that of all his daughters, the one who has given him the greatest pleasure is "the one who sells things . . . When she gets money, 593 152

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[14] In qualification, however, it must be noted that all Bang Chaners are extremely sensitive to social cues—partially as a consequence of having to balance off their individualistic propensities against the demands of the authority system—and here the children ignore their parents only because the latter have indicated by their very halfheartedness that they do not care. The children can, and do, quickly hop to it on the slightest indication of parental seriousness: a stern look, for example. My point, however, is that such looks are comparatively rare.

[15] In another paper, Hanks and Hanks (1963) make the same observation on the basis of behavioral materials.

593 None of the above is meant to imply that 79 percent of the adults of
155 Bang Chan would in fact give away their children. But the relatively high
*156 frequency of agreement they exhibited in admitting to such a possibility
• [125] and the fact that as many as 65 percent agreed that it was either good or
justifiable reveals something of the psychological environment within
which the Bang Chan child is reared and where he learns his basic
orientations toward other persons. The responses to this single stimulus
must of course be seen in the context of the more naturalistic, behavioral
593 materials presented earlier. The point of all these illustrations, however, is
155 that they indicate there is nothing sacrosanct about any human tie in Bang
*156 Chan, even that which exists between parent and child. If necessity or
571 personal predilection requires, then this tie too may be broken. What is
perhaps most significant here, from a developmental point of view, is that
the breaking of the tie always exists as a realistic potentiality in the life of
the child. Reared in an environment where he learns that no human tie
need be permanent or sustaining, the developing child inevitably takes on
some of these same patterns of expectation in his own dealings with others.
Thus the villager who abandons his spouse or the employee who with little
warning leaves his employer are acting in terms of patterns the prototypes
of which they either actually experienced as children or came to expect as
part of the realities of interpersonal relations in Bang Chan.

779 The second major source of the villagers' loose relationships lacks the
*156 developmental reference of the above. To a certain extent it is not even
social relational in nature, although our concern with it stems from its having crucial consequences to the social orientations of individuals. I am referring here to the Buddhist emphasis on the primacy of individual action and individual responsibility. Without going into a lengthy discussion of the subtleties of Buddhist doctrine, it is imperative to point out that the principal tenet of Hinayana Buddhism is the complete psychological freedom, isolation, and responsibility of every person. This is not the Occidental idea of "free will," but rather the notion that every person is a free agent, responsible only to and for himself, and that he inevitably reaps the fruits of his own conduct. Buddhist canonical literature is replete with references stressing the centrality of this doctrine. The last words of the Lord Buddha before he left this world to achieve the sublime state of *nibphaan* (nirvana) are said to have been: "Work out your own salvation with diligence." A frequently quoted passage of the *Dhamapada* reads: "By oneself is evil done; By oneself one suffers; By oneself evil is left undone; By oneself one is purified." The whole complex cosmology relating to the accumulation of merit and demerit is phrased in terms of the individual's lonely journey through cycles of interminable existences working out his own moral destiny. Who his progenitors were, what kind of environment he was born

123 friends" never numbered more than eight or ten people, out of a total population of 1,771.) Although their opinions differed in detail and covered a considerable range, they seemed to agree that I had a *good heart*. One villager said that he knew I had a good heart because children like me, "and children are only attracted to people who have good hearts." On the other hand, another more critical person said that my personality was just like that of a child, "because he always shows his feelings. He does not know how to be cool." The contrasts the villagers saw between myself and other researchers were particularly instructive. Of another field worker, an informant said: "he is not a kind person like *Aacaan* Herb, but he knows how to treat people in the Thai way. *Aacaan* Herb does not know how. He laughs too loud and does not use flattering words. He does not help me as much as the other person either." Yet, in contrast, another villager said: "I like *Aacaan* Herb because he likes me. He tells funny stories. He is not like some of the other *farang* who leave as soon as they get information from you."

123 The ultimate importance of these personal assessments are not easily
124 determined. One villager perceptively noted, for example, that although
[115] the "boss" of the Cornell team was a "good person," it really did not make any difference whether he was good or bad "because he is the 'boss' and bosses have to be respected." Of more direct relevance to the research was
[125] the fact that those individuals whom I counted among my warmest friends were not necessarily my best informants; in fact, some became inordinately anxious and evasive while taking the Sentence Completion Test and TAT. On the other hand, some villagers whom I had never seen before responded to these tasks with obvious enthusiasm. Even the villager who complained about my having wasted his time was a good informant, in the sense of appearing stimulated by and genuinely involved in responding to the sentence cues. It is clear, however, that villagers who liked me were the most approachable of informants, and were more ready, at least initially, to acquiesce to interview requests. The crucial factor here may well be the difference between responding to the field worker versus responding to the research; that is, even though all the respondents were originally induced into being interviewed as a favor to me—and their willingness was in part a function of how much they liked me—such favors did not necessarily carry over to the substantive purposes of the interview: reacting to my queries in a concerned and committed way. Thus, some informants went through the entire interview experience carefully fulfilling the interpersonal "obligation" but all but ignoring its content; others were so stimulated by the content that their initial attitudes toward me, positive or negative, became largely irrelevant. The vast majority of informants of course fell between these two extremes; and in no case were either the interpersonal or substan-

Introduction

121 This investigation was undertaken in connection with the Cornell Thailand Project, one of several studies under the auspices of the Department of Sociology and Anthropology which are focused on the process of cultural change. Bang Chan, the community chosen for intensive investigation, has been described previously (Sharp et al., 1953). The studies to be reported [101] herein were designed to contribute to a baseline description of the community culture and were carried out during the first and second years of a 5-year project, i.e. from September 1952-May 1954.

114 For the clinical examination of the school children and families, the research group consisted of Dr. Anusith Rajatasilpin, Miss Sapha Indrasud, Dua Srisuay, a local villager who assisted in many practical ways, and the author, who assumed major responsibility for planning and directing the work. Dr. Chumlong Kittiveja, of the Dental School, University of Medical Sciences, Bangkok, examined the teeth of the school children. Some data on sanitary practices were collected by Miss Saovanee Sudsaneh, in connection with the dietary survey.

121 The main investigations undertaken fall into two categories: 1) studies of nutritional status and 2) dietary studies, both qualitative and quantitative. In connection with both types of studies, information was collected concerning certain aspects of health and of sanitation in the village. Additional data concerning health practices, illness and death in Bang Chan were recorded by members of the Cornell research group in their field notes. This present report is concerned primarily with presenting findings from all of those sources regarding aspects of the health, sanitation and nutritional status in this rural Thai community.

Methods

Clinical Examination

125 Schedule. - In general, the clinical examination was directed toward discovery of signs and symptoms which might either be indicative of nutritional deficiency or of some disturbance which might be associated with or lead to nutritional deficiency. Certain items, such as cristal height, bicristal diameter, and age at menarche were included because information concerning them would contribute to our knowledge of norms for Thai people, and the clinical examination presented a good opportunity for obtaining such information.

12 As advoced by the Joint FAO/WHO Expert Committee on Nutrition (1951), this study combined clinical appraisal with dietary surveys. The only laboratory tests done were for hemoglobin content of blood, and examination of stools for parasites. Suggestions for planning the schedule for the clinical appraisal were obtained from the report on the second session of the Joint FAO/WHO Expert Committee on Nutrition (1951), Nicholls (1951) and especially from Professor Dean Smith of the London School of Hygiene and Tropical Medicine (1952).

• 125 Choice of physical measurements, and of procedures in making them, were influenced by a tentative list of specifications for anthropometric measurement, developed by the Committee on Anthropometry, Food and Nutrition Board, National Research Council (1951).

The schedule used for clinical examinations, and a description of procedures used, are included in Appendix A.$\overset{A}{\wedge}$

Sampling. - All of the children attending the Bang Chan primary school were examined. Three or four children who were listed on the school rolls were not present at any time during the period when examinations were in progress, and were considered by the teachers as non-attending.

Persons in a random sample of households in 5 of the 7 hamlets in the Bang Chan community were also examined. The two most outlying hamlets were excluded from the population to be sampled because of the difficulty, during the dry season, in getting to them or having them come to us. Of 230 households in the 5 hamlets, 31 were included in the random sample. Age and sex distribution of the 166 persons in the sample were roughtly similar to distributions for the approximately 1700 persons in the village as a whole, as determined in the census of December 31, 1953. Following is a summary of the age distribution:

[162]
[621]

Age in Years	Bang Chan, 7 Hamlets	Random Sample, 5 Hamlets
0-14	38%	41%
15-19	11%	10%
20-59	44%	41%
60 and over	7%	8%

[162] The sample included one Muslim family of 13 members.

In the 31 households, 166 of 184 persons, i.e. 90% were examined. Of the 10% non-response group, half were unavailable, for example away at work when the examinations were in [123] progress. The remaining members of the non-response group

$\overset{A}{\wedge}$ [See pp. 51-52--Analyst]

125 123 included adults of both sexes and some preschool children who were unwilling to allow the physician to examine them. The small non-response group included persons of both sexes and a wide range of ages, and would therefore not be expected to bias the sample seriously. In general, rapport and cooperation were excellent.

Reproductive Function in Females

[145] Information concerning menstrual history was obtained from girls and women in the random sample of village households, and from mothers of the infants and small children whose growth and food patterns were studied (See Appendix A, schedule 3, item 35).^

Information on child-bearing history was obtained from women in the random sample of village households, and from mothers of the infants and small children whose growth and food patterns were studied (See Appendix A, schedule 3, item 36).

Illness and Injury

12 [164] Evidence concerning the nature and extent of illness and injury in Bang Chan was obtained from various sources:

1) direct observation by the physician at the time of the physical examination, or when the physician was asked to visit a sick person in the village;

2) field notes in which information concerning illnesses, accidents and deaths were recorded as research workers learned of them; and

3) information obtained by structured interview in connection with surveys conducted by various persons working on the Cornell Thailand Project.

Adults in households which were included in the random sample were asked after the clinical examination whether any family member had been ill or injured during the past year. If so, the interviewer asked the nature of the illness or injury and what was done. The portion of schedule 6 which relates to this is included in Appendix A.^A

Some questions on illness were included in a survey of household heads in Hamlet KY-7 (Hanks, 1954) and in a structured interview to which there were 335 respondents from the

A [see pp. 51-52--Analyst]

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141 145 Among the men and boys in the random sample of households, however, mean height and weight was distinctly less for the age group 15-19 (mean age 17) than for the older age groups (Table 4),[A] and mean height and weight increased with age among the subgroups. Thus mean height of 4 boys 18 and 19 years old was 157.6 cm., and mean weight 50.2 kg. as compared to 150.1 cm. and 38.5 kg. for 4 boys aged 15-16. Among the 20 men in age group 20-39, 3 were age 20, and 4 either 23 or 24. Mean heights for both of these subgroups were 157 cms. The number of young men examined in Bang Chan is too small to permit judgment as to when adult stature is attained. On the basis of measurements of Siamese males, from the medical service of the Royal Siamese Navy, Dr. Yong concludes that "growth, as regards both height and weight stops at age 22" (Chutima, 1939). According to Zimmerman (1937) rural Siamese boys increase in height steadily until about 19 years of age, at which time they seem to have reached maturity. Adult men in Bang Chan were on the average a little shorter than other groups of Thai men whose measurements were available to us (Table 7).[B]

Bicristal Diameter. - Some additional information concerning body build is obtained from this measurement. In general, for Bang Chan children of elementary school age (Tables 1 and 2),[C] mean bicristal diameters correspond to hip widths for Iowa school children one to three years younger (Stuart and Meredith, 1946). Mean bicristal diameters of adult men and women in Bang Chan (Tables 4 and 5)[D] correspond approximately to the values for the 10th percentile of the 18 year old boys and girls in the Iowa study. Andrews (1943) found the hip breadth of Central Thai men to be 26.98± 1.48 cm., which is similar to the mean of 26.9 cm. for 31 adult males, aged 20-59, in Bang Chan.

141 145 125 Cristal Height. - At the time this study was undertaken, the Committee on Anthropometry of the Food and Nutrition Board, National Research Council had tentatively recommended cristal height as an additional measurement pertaining to the long dimension of the body. Mean values and ranges, for various age groups, are presented in Tables 1, 2, 4 and 5.[E]

Dental Status

164 125 A dentist examined the teeth and mouths of 226 school children, 7 to 14 years of age, in good natural light, using mouth mirror and probe. Teeth of persons in the random sample of village households were inspected by the physician in the course of the clinical examination. Data on dentition and dental health were analyzed by Kamalanathan (1956).

000 As noted by the Joint FAO/WHO Expert Committee on

[TEXT CONTINUED ON PAGE 21]

A,B,C,D,E [see p.: [A]16; [B]20; [C]9-13; [D]16, 17; [E]9-13, 16, 17]

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146 121 As noted by the Joint FAO/WHO Expert Committee on Nutrition (1951) the part played by diet in the production of teeth which are unduly susceptible to caries is still controversial, although in general, the importance of nutrition, especially in the formative period, is widely accepted. In accordance with the recommendation of this Committee, caries rates are recorded as a separate item, and are not taken as a criterion of malnutrition.

145 125 Dentition. - Median ages of eruption of specific permanent teeth in 240 Bang Chan children, ages 7 to 14, are shown in Table 20 (Appendix B). For this purpose, data on 226 children in the Bang Chan primary school, and 14 additional children between those ages, in the random sample, were included. The percentage of boys and girls at each age, having each specific tooth erupted, was calculated. Median ages of eruption were estimated according to the method suggested by Klein et al. (1937). A graph was drawn for each kind of tooth, for each sex. Cumulated percentages for each specified kind of tooth erupted were represented on the x axis and age in years at one year intervals on the y axis. Median age of eruption was estimated by determining the point at which the age percentage eruption curve cut the 50% perpendicular.

145 In Bang Chan, as elsewhere, the median age of eruption for specific tooth is lower for girls than for boys. In some cases the difference is slight, in others, from several months to more than a year. The difference is most marked for lower canine teeth.

The average number of teeth, deciduous, permanent and total, at each age, is shown for children 7 to 14 years of age, in Table 21 (Appendix B). For ages 8 to 13, the greater dental maturity of girls than boys is reflected in the larger average number of permanent teeth present at each age.

On the basis of median ages of eruption for specific teeth, and the number of permanent teeth per child at each age level, dental maturity of children in Bang Chan appeared to be approximately the same as for children in other regions, in both eastern and western hemispheres, with which they were compared. Although the average number of teeth at some ages was lower for children in Bang Chan than for American or English children, the differences were neither marked nor consistent (Kamalanathan, 1956).

144 Caries Incidence. - Caries incidence was found to be low among Bang Chan children as compared to many regions in which surveys have been made. Of 226 children examined by the dentist, 42% (45% of the boys and 38% of the girls) were totally free of caries. When all carious teeth, both deciduous and permanent, were included, the average number of carious teeth per child was 1.8 (1.6 for boys and 2.0 for girls).

276 chewing, the extent to which the betel leaves and areca nuts are associated with festival occasions must be taken into consideration. Betel chewing was forbidden in Thailand by the Thai government but the enforcement of this regulation proved impossible and it has been forgotten since World War II.

Nutritional Status

149
125 Incidence of Anemia. - Hemoglobin was determined by means of a Spencer Hb-meter. About 9% of the school children had hemoglobin values below 11.5 g. per 100 ml. but one value only was below 9.75 g. (Table 8). As might be expected since none of the girls in the primary school had passed the menarche, no difference was apparent between values for boys and girls.

Table 8

147 Hemoglobin Values of 233 Children, Ages 7-14, in the Bang Chan Primary School, 1952-53

	Number of Children	Hemoglobin, grams per 100 ml.					
		Under 9.75	9.75-11.5	11.75-12.5	12.75-13.5	Over 13.5	Not Ascertained
Boys	121	0	10	32	44	33	2
Girls	112	1	10	25	38	37	1
Total	233	1	20	57	82	70	3

In the group of persons 15 years and older, in the random sample of village households, the usual difference in hemoglobin values between males and females is evident (Table 9).^ About 6% of the males and 25% of the females had hemoglobin values of 11.5 g. or less/100 ml. with one only below 9.75 g. Many of these might be considered as borderline rather than anemic.

^[see p.25- Analyst]

Table 9

147 Hemoglobin Values of 104 Residents, Age 15 and Older, in Random Sample, Bang Chan, 1952-53

	Number of Persons	Hemoglobin, grams per 100 ml.					
		Under 9.75	9.75-11.5	11.75-12.5	12.75-13.5	Over 13.5	Not Ascertained
Male	48	0	3	7	9	28	1
Female	56	1	13	10	14	11	7
Total	104	1	16	17	23	39	8

Occurrence of Possible Signs of Malnutrition. - Most of
146 the signs and symptoms included on the schedule for clinical
125 examination were those known to be of value in the assessment
of nutritional status (Joint FAO/WHO Expert Committee on
Nutrition, 1951). Some items included need to be investigated
more fully before their value can be determined. Among the
146 items on the schedule, (Appendix A), ^ the following were not
164 observed in any of the persons examined:

Eyes: photophobia, lachrymation, blepharitis, xerophthalmia, Bitot's spots, gross corneal vascularisation.

Face: Folliculosis, nasolabial seborrhea, dyssebacia, suborbital pigmentation.

Lips: Scars of cheilosis and of angular stomatitis.

Tongue: Edema, color change to scarlet or magenta. (In 30 adults, however, such color changes if present would have been obscured by the discoloration from betel chewing.)

Gums: Retraction, loss of interdental papillae.

Parotid glands: Enlargement.

Skin: Perifollicular congestion, petechiae.

Edema

Calf tenderness

Inability to rise from squatting ^ [see p 51-Analyst]

146 pictured as bowlegged in Chutima's report (1939) are, however,
142 clearly so, and represent more extreme cases than we encountered among the children in Bang Chan in 1952-53. If the incidence of bowleggedness among children in Thailand is indeed decreasing, an investigation into possible causes of the change would be of interest.

142 To the nutrition specialist on the team, who was not Thai, the knee joints appeared to be large. Moreover, although the term "knock knees" was not included on the schedule, it was entered frequently by the physician under comments (Appendix B, Table 22).A Whether this condition is related to heredity,
[516] nutritional status, or to some other environmental influence such as the life-time habit of squatting on the heels, is not known.

146 The physician's estimate of general appearance and vitality were recorded early in the examination, before he sought for specific signs. About 80% of all persons examined were rated as "good," and less than 1% as "poor." About half of all persons rated as "good" in general appearance and vitality were without clinical signs, as compared to about 30% of those rated "fair." Of persons with 3 or more possible signs of malnutrition, however, about 2/3 were rated "good" (Appendix B, Tables 23 and 24).B As has been observed frequently, such a general appraisal is not correlated with the presence or absence of clinical signs possibly associated with malnutrition. Clearly, in Bang Chan, there is little or no malnutrition of the sort that causes marked apathy.

In summary, a variety of possible signs of malnutrition were noted both in the school children and the persons in the random sample of village households. More than half of the total number examined had one or more signs possibly due to malnutrition, but the only clearly defined deficiency disease encountered was one case of beriberi[1] in a 49-year old man.

Reproductive Function in Females

84 Menstrual History. - Information concerning menstrual
125 history was obtained from girls and women in the random sample of village households, and from mothers of the infants and small children whose growth and food patterns were studied.

145 Most of the women from whom information on age at menarche was obtained were under 40 years of age. A few could

---

[1] History of beriberi among nursing mothers and their
[164] infants was obtained in several instances, and cases of beriberi, in both sexes, were seen among persons not included in the population samples which were examined.

A [see p.71-An] B [see pp.72,73-Analyst]

145 Deaths of infants a few days old, with a description of lockjaw, inability to suck, stiff back and clenched hands, were recognized as due to tetanus. [844] The common practice of native midwives is to place the cord over a hard rhizome or clod of earth and to cut it with a tapered piece of bamboo. Thus, infection with the tetanus organism may occur from contact with the soil. Note that 12 of 26 deaths reported for infants under 1 month, were diagnosed as tetanus or probably tetanus. Zimmerman (1931) summarized important causes of death in Siam, based on the physician's diagnosis made after symptoms were described by the head of the household. Of 1800 deaths which occurred in the 18 months preceding the survey, 2% were diagnosed as tetanus. For the Central area, 3.8% of 495 deaths were from tetanus. Most, if not all of the cases of infantile tetanus could be prevented if native midwives learned to avoid contact of the cord with earth or a soil-coated rhizome. By using sterile scissors for cutting the cord instead of tapered bamboo which must be pressed against another surface to accomplish the cutting, contact with soil could be avoided. Of 335 household heads interviewed, 220 owned scissors of some kind (Ralis, 1955).

Infants several months old, who had some of the symptoms of infantile beriberi, as convulsions and almost voiceless crying, were considered as cases of infantile beriberi only if the mother had symptoms of beriberi, such as numbness or tingling in the extremities, or difficulty in walking, at the time. One mother had lost 3 infants at 3 or 4 months of age, with similar symptoms, but described the symptoms of beriberi in herself at the time of the death of the last baby only. The other two cases were therefore listed as convulsions, cause unknown. [146] The occurrence of infantile beriberi reflects the unsatisfactory nutriture of the mother, whose milk is therefore low in thiamine content. To prevent deaths from infantile beriberi, the general level of nutrition in the village, and particularly the food habits of pregnant and nursing women, should be improved.

Note also the number of deaths from "debility." As the Joint FAO/WHO Expert Committee on Nutrition (1951) has pointed out, the number of early deaths from "congenital debility" becomes insignificant where the health and nutritional status of pregnant women approaches the optimal.

Intestinal Parasitism and Bowel Habits

126 Intestinal Parasitism. - All school children were provided with tin containers labelled with their names, and asked
• 125 to bring a stool sample to school. Fourth grade children
164 whose first stool samples were negative, were asked to bring a second specimen. Parasites were found in some of these second

125 specimens. In all, specimens were obtained from 189 or 81% of
the children and of these 32% were negative. In 128 stools
126 containing parasites, 196 infecting organisms were found, or an
average of 1.5 per infected child. Protozoa and helminths which
164 are pathogenic or which may cause severe diarrhea were identified
126 times, and harmless forms 70 times. Of the harmful
forms, Ascaris lumbricoides was found in 96 or 51% of the stool
samples, Giardia lamblia in 19, or 10%, and hookworm, Endamoeba
histolytica, Trichuris trichiura and Diphyllobothrium in 2% or
less. Of the harmless forms noted, Endamoeba coli was found in
45 specimens or 24%, Iodamoeba williamsi in 21 or 11%, Endolimax
nana and Chilomastix mesnili each in less than 2%. Doubtless
the extent of intestinal parasitism in these school children was
greater than the figures indicate, since some cases would be
missed in examination of single stool specimens collected in
this way. One might expect intestinal parasitism to be relatively
common, also, among other family members.

125 Bowel Habits. - In connection with the clinical survey,
persons examined were asked whether they had "constipation" or
147 "diarrhea" frequently, occasionally, or never, i.e. not within
the past 6 months. As the physician phrased the questions concerning
514 "constipation," the replies indicated whether the respondent
had daily bowel movements ("never constipated"), or
usually had a bowel movement each day ("occasionally constipated")
or usually had longer intervals between bowel movements
("frequently constipated"). Replies are summarized in Table 17. A

Considering the inadequate sanitation in Bang Chan, and
126 the prevalence of intestional parasitism, the fact that 3/4 of
147 the persons questioned said they "never" had diarrhea, is
worthy of note. Most persons who reported having diarrhea
were troubled occasionally rather than frequently. The fact
[146] that nearly 2/5 of those questioned had bowel movements less
often than once a day, is not surprising in view of the fact
that diets which are relatively low in fibrous foods and in the
B complex vitamins frequently result in sluggish behavior of
the large intestine. That approximately 3/5 of the respondents
in Bang Chan usually had a daily bowel movement is perhaps more
noteworthy. Even in areas where diets tend to be much more
liberal, some persons usually have bowel movements at intervals
of 2 or 3 days or even longer. If such persons have stools of
normal character and experience no discomfort, this bowel
habit may be considered normal for them.

A [see p. 43 - Analyst]

Appendix A

Schedule for the Clinical Examination

• 125

Cornell University Thailand Project 1952-53. Schedule 3.

Date ....

1. Hamlet ..... House No......

2. Name 1)....................
         2)....................

3. Sex M F

4. Birth date ....
         Age yr...... Mo......

5. Single ..... Married....yr.

6. Weight .... kg.

7. Height .... cm.

8. Bicristal diam. ...... cm.

9. Cristal Ht. .... cm.

10. General appearance and vitality:
    poor....fair....good.......

11. Hemoglobin:

12. Stool examination:

13. Hair:
    a. Dry and staring ....
    b. Diminution or loss of pigment ....

14. Eyes:
    a. Photophobia ....
    b. Lachrymation ....
    c. Blepharitis ....
    d. Xerophthalmia ....
    e. Excess conjunctival tissue ....
    f. Bitot's spots ....
    g. Corneal vascularization (gross) ....

15. Face:
    a. Folliculosis ....
    b. Nasolabial seborrhea ....
    c. Dyssebacia ....
    d. Suborbital pigmentation ....

16. Lips:
    a. Cheilosis ....
    b. Scars of cheilosis ......
    c. Angular stomatitis ......
    d. Scars of angular stomatitis ....

17. Tongue:
    a. Papillae atrophied ......
    b. Papillae hypertrophied ......
    c. Edema ....
    d. Color change-scarlet ....
    e. Color change-magenta ....
    f. Appearance-fissured .....
    g. Appearance-geographical .....
    h. Not ascertained - Betel .....

18. Gums:
    a. Swelling ....
    b. Redness ....
    c. Recession ....
    d. Retraction ....
    e. Loss of interdental papillae ....

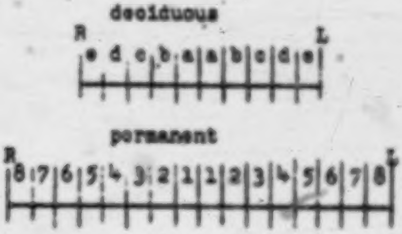
19. Parotid glands enlarged ....

20. Thyroid:
    a. Enlarged ....
    b. Scars ....

21. Betel: Yes...... No........

Schedule for the Clinical Examination (continued)

22. Teeth



0 - missing $\overset{+}{-}$ - just erupting
X - carious ∅ - filled

23. Skin:
- a. Symmetrical dermatosis ......
- b. Phrynoderma ....
- c. Perifollicular congestion ......
- d. Petechiae ....
- e. Xerosis ....
- f. Loss of elasticity ....
- g. Atrophic ....
- h. Ulcers ....

24. Edema: ....

25. Knee jerk absent ....

26. Ankle jerk absent ....

27. Calf tenderness ....

28. Inability to rise from squatting ....

29. Liver enlarged ....

30. Spleen enlarged ....

31. Posture-Winged scapulae ....

32. Skeleton:
- a. Frontal bosses ....
- b. Beaded ribs ....
- c. Wrists enlarged ....
- d. Bowed legs ....

33. Diarrhea:
- a. Frequent ....
- b. Occasional ....
- c. Never ....

34. Constipation:
- a. Frequent ....
- b. Occasional ....
- c. Never ....

35. Menstruation:
- a. Regularity: Yes....
  No.....
- b. Duration, ...da
- c. Interval ....
- d. Menarche, ...yr
- e. Menopause ....yr

36. Children:
- a. Total children born ....
- b. Number of children alive now ....
- c. Stillbirths ....
- d. Deaths in utero ...
- e. Miscarriages ....
- f. Other deaths ....
- g. Age of the oldest child .....yrs.
- h. Age of the youngest child .....yrs.

Comments ....

....

....

....

....
Examiner

Procedures Used in Obtaining Information Recorded on Schedule for Clinical Examination, and Descriptions of Possible Signs of Nutritive Failure

114 For the clinical portion of the nutrition survey, the team consisted of a Thai physician, who carried out the clinical examination, the nutritionist, who made the physical measurements, a second-class chemist, who did the hemoglobin determinations and served as interpreter, and a local boy who not only propelled the boat but helped in other ways such as giving directions to the children concerning preparations for being weighed and measured. The nutritionist was the only non-Thai on the team. The physician's internship had been served in a hospital in which he had opportunity to see many patients with nutritional disorders.

125 The material which follows is primarily descriptive of the procedures agreed upon in advance of the clinical examination. When different descriptions of a given sign were obtained from the various sources, the criteria which the physician agreed to use, after discussion with the nutritionist, are stated here. Some of the signs described were not observed in any of the persons examined in Bang Chan.

Before beginning the survey, the examining physician and the nutritionist agreed that only signs which could be considered undoubtedly positive should be so recorded.

141 c/25 In preparing the schedule, care was taken to avoid diagnosis, i.e. the physician was to record what he saw. If the examining physician believed diagnosis or probable diagnosis would be helpful, he recorded this under Comments. Thus Comments included such items as the following:

1. Diagnosis of deficiency disease, together with nature of onset, association with other conditions such as pregnancy, malaria or dysentery.

2. Obvious present disease as trachoma, ring worm etc. or evidence of past disease, as smallpox scars.

3. Complaints such as bloody stools, or other conditions which might affect adversely the general health and nutrition.

The schedule was designed to be used with all ages and both sexes. Items relating to menstrual and child bearing history were placed at the end, to be used for adolescent girls and women.

Comments on the items on the schedule follow:

1. Hamlet and house number. Information given by the school child or householder was checked later with the census data.

125 128 2. *Name*. The name was recorded according to the Mary Haas system of transliteration, modified for use on a typewriter. Later a code number was given each individual examined.

3. *Sex*. The appropriate symbol, M or F, was circled.

4. *Birth date*, when known, was recorded in Thai, according to the Thai calendar. This information was later translated into age in years and months. Information given by school children was checked against that in the school records, which were obtained by the school teachers from the *Naai Amphoeoe*, or district officer. At present, parents are required by law to register the birth of a child within 15 days. In practice, however, the interval between birth and registration is frequently longer, and the recorded date may be somewhat later than the actual birthdate. In preparing height-weight-age tables, age to nearest birthday was used. In a few cases, the birth date as given by a school child and that in the school records differed enough so that age to nearest birthday was in doubt. Data for such children were omitted in preparing the tables.

5. *Marital status* was recorded either as *single*, or the *number of years married*. To avoid embarrassment if there had been no legal marriage, the question was phrased so as to mean "How long have you had a house?"

6. *Weight*. A bathroom scale with 1/2 kg. divisions, with a magnifying glass over the scale reading so that one might interpolate to 1/4 kg., was used. All persons were asked to stand with the feet squarely on the platform, with the toes not extending beyond it. In order to get weights under as nearly standard conditions as possible, school children and adults were instructed to remove all but a minimum of clothing. [291] All boys, and the younger school girls removed their blouses, belts, and any items in pockets, leaving only short trousers, for the boys, and for the girls, a Thai-style skirt (*phaasin*) or standard western style school costume consisting of cotton skirt with attached bib and shoulder straps. [291] Older girls were asked to remove the outer blouse and belt but were allowed to keep on the under blouse or camisole, as well as skirt. The children did not wear shoes to school.

[291] In the homes, preschool children were usually weighed nude, older girls and women in inner blouse, and *phaasin* or *phaanung*, and the men in trousers only.

Several examples of each type of clothing were weighed. Clothing worn by children whose body weight was 22.5 kg. or less, usually weighed considerably less than 1/4 kg., and would therefore make no detectable difference in the observed weight. Clothing worn by the larger school children and adults weighed, on the average, about 1/4 kg.

125 School children were asked to empty the bladder before
being weighed. To minimize the effect of food, school children
126 were weighed between 10 A.M. and noon. We were unable to carry
out these precautions in connection with the survey of persons
in a random sample of village households.

7. Height. A locally made wooden measuring device, hinged so as to fold (4 sections, each 50 cm. long) and provided with a sliding set square, was used for measuring height. The individual was told to stand with heels and shoulders against the measuring device, with chin parallel to the floor. Persons old enough to cooperate were asked to take a deep breath and "stand tall." The set-square was brought into contact with the person's head and the height, to the nearest ½ cm., noted. Smaller school children sometimes had to be helped to assume the desired position. An infant was measured by putting the device on the floor, and placing the baby on it. The knees were then pressed down, so that the backs of knees were in contact with the scale. One team member then placed a flat-surfaced object such as a book, perpendicular to the scale, against the soles of the feet, while another brought the set-square into contact with the infant's head.

8. Bicristal diameter was measured with a pelvimeter. The subject stood, with heels together, before the examiner, who felt for the highest points of the iliac crests, and placed the pelvimeter, with firm pressure. The pelvimeter was calibrated in centimeters, but readings were estimated to the nearest 0.5 cm.

9. Cristal height. The height of the iliac crest was taken as the vertical distance of the left iliac spine from the floor. The subject was asked to stand with left side toward the measuring device used for height, and the distance of the set square from it. The examiner felt for the iliac crests, placing her right hand so that the thumb was at the level of the tip of the iliac crest. She tried to see that the subject's pelvis was held level and not tipped. An assistant then lowered the set square to the examiner's thumb, and the height was measured by reading the level of the set square.

10. General appearance and vitality. This item represented the examining physician's impression of the behavior of the subjects. Facial expression, attitude, degree of alertness, and behavior while waiting for the examinations were taken into account. Thus a child with good vitality would appear alert and interested, whereas a child who was rated poor might be apathetic, abnormally subdued or lacking in initiative.

11. Hemoglobin was determined by means of a Spencer Hb-Meter (American Optical Co., Scientific Instrument Division, Buffalo 15, N.Y.). Values were recorded in grams per 100 ml. of blood. Very little resistance was encountered to the finger

125 puncture, although a few adults and two school age children re-
128 fused. No attempt was made to determine hemoglobin for most
children under school age.

12. Stool examination. Each school child was furnished with an appropriate container labelled with his name. Pupils were asked to bring the container, with stool sample, to the teacher. Specimens were examined at the Pathology Department of Chulalongkorn Hospital.

13. Hair.

a. Dry and staring. Hair which has lost its normal sleekness and luster, and is dry and brittle.

b. Diminution or loss of pigment. In dark haired
[142] people, an auburn tinge is evident in mild cases. (Note: None
of the cases seen in Bang Chan had progressed beyond this to
"ginger" or tow-colored hair).

14. Eyes.

a. Photophobia, when present, was always recorded. If obviously due to some non-nutritional eye disease, this fact was recorded under comments.

b. Lachrymation, which is often associated with photophobia, was recorded when elicited by brief eye examination.

c. Blepharitis. Inflammation of the muco-cutaneous junction of the eyelid, with or without scaling and crusting or loss of eyelashes. If blepharitis was obviously associated with some non-nutritional eye disease, such as trachoma, this fact was recorded under comments.

d. Xerophthalmia. The conjunctiva is abnormally dry and appears thickened, yellowish and opaque.

e. Excess conjunctival tissue. Thickening of the bulbar conjunctiva, which appears opaque and yellowish. The tissue is moist. When the subject moves the eye from side to side, a thickened conjunctiva is thrown into a moving ripple of folds.

f. Bitot's spots. An extreme form of thickening of the epithelium of the bulbar conjunctiva. The spots resemble patches of chalk paste which have been striated with a pin.

g. Corneal vascularization (gross). Loops of newly-formed capillaries appear near the corneal margin, and extend onto the cornea. Since a slit lamp, which is necessary for observation of early stages, was not used, gross changes only could be noted.

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15. Face.

a. Folliculosis. Pouting of the sebaceous and pilo-sebaceous follicles of the face.

b. Nasolabial seborrhoea. A scaly or greasy desquamation; flaky accumulations of seborrhoeic material in the nasolabial folds.

c. Dyssebacia. A condition probably representing a severer degree of folliculosis. The pouting sebaceous follicles contain plugs of greasy material. The condition is usually most marked in the nasolabial folds, but in severe cases extends to the nose, cheeks, chin and the whole butterfly area.

d. Suborbital pigmentation. A brownish or greyish-brown area of pigmentation under the eyes, often seen in severe starvation.

16. Lips.

a. Cheilosis. The earliest change in cheilosis is a loss of the normal uniformly shiny appearance of the vermilion of the lips. A somewhat "velvet-like" appearance is associated with a milky "bloom". In more severe cases the lips are reddened, capillaries are engorged and the mucosa at first appears thin and shiny; later, scaling, ulceration and cracking may occur, with crusts of blood and serous exudate.

b. Scars of past cheilosis; Multiple antero-posterior linear scars of the lips; the vermilion of the lips takes on a slightly tissue-paper like appearance.

c. Angular stomatitis. A lesion which varies in severity, ranging from slight scaliness with small cracks in the epithelium at the corners of the mouth to a pale, moist and ulcerated appearance with fissures extending onto the neighbouring skin of the face.

d. Scars of angular stomatitis. Scars in the corners of the mouth.

17. Tongue.

a. Papillae atrophied. The tongue is dry, smooth and glazed, with atrophy of the papillae.

b. Papillae hypertrophied.

c. Edema. Swelling which is evidenced by indentations of the teeth along the margin of the tongue.

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125 128 d. Color change - scarlet. A bright red color of the tongue, like that of raw beef.

e. Color change - magenta. The normal pink color of the tongue is changed in the direction of blue or purple.

f. Appearance - fissured. The presence of deep central or lateral fissures which may run antero-posteriorly or transversally.

g. Appearance - geographical. Superficial erosion of the tongue, appearing in irregular patches. These are redder than the unaffected area.

h. Not ascertained - Betel. This category was added to designate cases in which the tongue was so coated from betel chewing that color changes and changes in papillae could not be noted.

18. Gums.

a. Swelling. Swelling of the interdental papillae with an increased tendency to bleeding when the papillae are pressed. Later, the whole gum may be swollen and purplish.

b. Redness (gingivitis). The gums are red and hyperemic, particularly at the margins.

c. Recession of the gums.

d. Retraction. The margins of the gums become detached from the teeth.

e. Loss of interdental papillae. The papillae no longer fill the interdental spaces neatly.

19. Parotid glands enlarged. Mild degrees of enlargement may be detected more readily by observation from above or behind than from in front. Both Smith (1952) and Nicholls (1951)[1] mentioned the association of parotid enlargement with malnutrition in the tropics.

20. Thyroid enlarged. Obvious enlargement was recorded. An item was included for scars of thyroidectomy, if any should be seen.

21. Betel. If the subject chewed betel frequently or habitually, so that the teeth were stained, this item was checked "yes". In the "no" category, may be some persons who have tried

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1. Nicholls, 1951, p. 354.

125 betel chewing, but have not persisted in it.

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22. Teeth. Changes in the teeth were noted by means of a series of symbols on two dental diagrams, one for deciduous and one for permanent teeth. Teeth just erupting, missing, carious or filled were noted. A dentist examined the teeth of the school children, in good natural light, using mouth mirror and probe. Inspection of persons in the random sample of families was carried out by the physician without mirror or probe, therefore the record is of gross changes only. If a tooth was crowned, the physician inquired whether the tooth had been sound or carious before being crowned.

23. Skin.

a. Symmetrical dermatosis. Any skin disorder which had a symmetrical distribution was noted, and the physician's diagnosis recorded under Comments. Pellagroid dermatosis begins as an erythema resembling sunburn and develops into a symmetrical, rough hyper-pigmented dermatosis with sharply defined margins, usually on areas exposed to sunlight. Areas may desquamate with serous exudate in the centre.

b. Phrynoderma. A type of follicular hyperkeratosis which occurs on the back of the arms, on the thighs, abdomen, shoulders and buttocks. Viewed through a lens, the enlarged glands are seen to be plugged. The eruption can be felt by passing the tips of the fingers over it.

c. Perifollicular congestion. Congestion occurs around the hair follicles, frequently limited to the legs and forearms.

d. Petechiae. Pinpoint hemorrhages, which are most apt to occur around hair follicles.

e. Xerosis. Dryness of the skin, diminution or absence of sebaceous secretions, sometimes also of sweat. (Note: Crackled skin was originally included as a separate sign. No clearly defined cases were noted, however, and since the physician was uncertain of the distinction between early stages of crackled skin, and xerosis, the latter term was used to cover all such lesions.)

f. Loss of elasticity. Diminution of suppleness of skin seen as a fine wrinkling, particularly over the calves. When the superficial skin is pinched up and released it returns very slowly to its smooth condition.

g. Atrophic skin. Thinning of the skin, generally most marked on legs below the knee. The skin usually appears smooth, tightly stretched and shiny.

Note: The skin changes known as xerosis, loss of elasticity and atrophic skin, which are associated with defective nutrition, mimic closely the changes in senility.

125 128 h. Ulcers. Single or multiple ulcers, other than those associated with varicose veins, confined to the skin of the legs below the knees.

24. Edema, if present, was noted.

25. Knee jerk. Absence of the knee jerk was recorded.

26. Ankle jerk. Absence of the ankle jerk was recorded.

27. Calf tenderness. The patient's reaction was noted when the calf muscles were squeezed firmly.

28. Inability to rise from squatting. The patient is made to squat with his thighs fully flexed on his legs, and is asked to rise. When this is done with difficulty, the hands grasping the knees and aiding the legs to bring the body into an erect position, the test is positive.

(Note: This test was not applied to persons who were obviously active and had good muscular coordination. Thai customarily sit or squat on the floor, and would be peculiarly aware of such difficulty.)

29. Liver enlarged.

30. Spleen enlarged.

For this part of the examination (items 29 and 30), the subject was asked to lie on his back with his knees flexed, to relax the abdomen and take a deep breath. The physician palpated the costal margins in the usual manner. If liver or spleen were found to be enlarged, the appropriate space was checked, and the description of size and texture of the organ entered under Comments.

31. Posture:

Winged scapulae. The fingers can be placed easily under the inner border or tip of the scapula.

32. Skeleton.

a. Frontal bosses. Protruding forehead, giving the person a "box-headed" appearance.

b. Beaded ribs. A line of enlargement at the costochondral junction of the ribs.

c. Enlargement of epiphyses at wrists.

d. Bowed legs. The subject was asked to stand with feet parallel and together, the body erect. If the space between his knees was more than 1 finger breadth (1.5 cm.) or the legs below the knees curved outward obviously, the person was considered to be bow legged.

125 e. Knock Knees. The subject was considered to be
128 knock kneed if the knee joints overlapped markedly.

33. Diarrhea. As phrased, the question meant literally "Do your bowels run or not?" If the answer was affirmative, the physician asked further questions to determine about how often this occurred. "Frequent" diarrhea meant that watery stools were passed every week, i.e. that stools seldom were formed. "Occasional" diarrhea meant the passing of watery stools once in a long time, and "Never" meant that diarrhea had not occurred within the past 6 months.

34. Constipation. The question as asked by the physician meant literally "Do you have a stool every day?" The physician checked "frequent" if the subject did not usually have a bowel movement each day; "occasional," if the subject usually had a daily bowel movement, but once in a while a day was skipped. "Never" meant that the subject had a bowel movement daily during the previous 6 months.

Note that this question does not relate to constipation, in the true sense, since it tells nothing of the character of the stool or feelings of the subject, but is confined to the interval between stools.

35. Menstruation.

a. Regularity. This was indicated by a check mark after yes or no.

b. Duration. The question "How many days does it last?" The number of days, as stated by the informant, was recorded.

c. Interval. The replies were grouped into 3 categories: 1) usual interval, i.e. about 1 lunar month; 2) markedly less than 1 month; or 3) markedly longer than 1 month.

d. Menarche. The age in years, at first menstruation, was recorded. Young girls, who appeared adolescent, were asked by the physician if they had menstruated yet. To be sure the question was understood and properly answered, a woman school teacher questioned these girls separately.

e. Menopause. Age, in years, of last menstruation, was recorded for women who had passed the menopause.

36. Children. Appropriate numbers were recorded in each category.

a. Total children born . . . . . .

125 b. Number of children alive now . . . . . .

128 c. Stillbirths . . . . . .

d. Deaths in utero . . . . . .

e. Miscarriages . . . . . .

f. Other deaths . . . . . ., i.e. deaths of children born alive. Notes were made on the age and circumstances of death. When the description was clear, the physician noted the cause of death.

g. Age of the oldest child . . . . . . in years.

h. Age of the youngest child . . . . . . in years.

The investigator noted whether or not related items such as years of marriage, age of oldest child, age of youngest child, age at menarche, and age at menopause, were reasonably consistent. A few replies were discarded as unreliable.

• 125

Schedules Used in Recording Information on Sanitation

Cornell University Thailand Project, 1952-53,
Schedule 8, Sheets 1 and 2.

F. At this season what kind of water is used for each of the following purposes, and what treatment, if any, is given to it?*

USE	SOURCE			TREATMENT			
	Rain	Khlong (canal)	Fish-pond	None	Alum	Boiling	Other (what)
1. Drinking, adults							
2. Drinking, children							
3. Washing vegetables							
4. Cooking							
5. Washing dishes							

G. How is garbage disposed of? (check)

1. Buried ....
2. Burned ....
3. Thrown into Khlong (canal) ....
4. Thrown elsewhere ....
5. Fed to animals ....
6. Other ....

H. Does the householder attempt to protect food against contamination by insects, animals etc.? Note means used.

Means used	Type of Food	
	1) Dry rice -- other nonperishable foods	2) Perishable foods and left-over cooked foods
1. Container covered:		
a) Solid cover		
b) Faachii (fiber)		
2. Food safe:		
a) Screened		
b) Ant-proof legs		
3. Other		
4. None		

* Indicate whether answer is obtained by query (q) or observation (obs.)

125 Cornell University Thailand Project, 1952-53, Schedule 6.

3. Toilet facilities:

a) Flush latrine ...... b) Pit ...... c) With cover ....

d) None - Use:	Compound	Fields	Khlong (canal)	Other
For urination				
For defecation				

e) Treatment of feces (for items b. & d. only)

1) None ..... 2) Covered with earth ..... 3) Other ...

f) "Toilet paper" : 1) Newspaper ..... 2) Straw paper ......

3) Cocoanut husks .....

4) Other ....

• 125 Schedules Used in Recording Information on Illness or Injury

Cornell University Thailand Project, 1952-53, Schedule 6.

1. Has any member of the family been ill or injured during the past year? Yes ..... No .....
2. If yes, give details below:

a) Family member:	b) Nature of illness or injury:	c) What was done?*

* Include persons asked for help; drugs used, with information from labels if available; and techniques.

Household Questionnaire, KY-7, March-April 1954 (Hanks)

Question: Was there serious sickness in your family during the past year?

If R says that serious illness occurred in his family:

What was the name of person who was ill?

What was the name of the illness?

Names of persons who were called to treat the patient, listed in the order in which they were called.

Cornell Methodology Project: Thailand
Bang Chan Structured Questionnaire

28. a. Your own children, all of them that have ever been born, how many are there?

b. How many of your children are still living?

c. How many of your children have died?

Responses to this question follow:

Children of 331 Household Heads, Bang Chan

Item No.	(28a.) Number born	(28b.) Number still living	(28c.) Number dead
None	24	29	198
1	32	40	44
2 or 3	69	83	56
4 or 5	73	82	17
6 or more	133	97	9
Number of respondents	331	331	324

33. a. Have you ever been to a clinic or a hospital?

b. If YES: In what various places?

c. If R HAS BEEN TO CLINIC OR HOSPITAL: For what various purposes did you go?

*177
*178 The Innovations

243 A. Agricultural Innovations. During the past few years,
certain innovations have come to Bang Chan which have increased
433 agricultural productivity and improved the level of living. Some
of these innovations are listed below.

1. The small motor. One innovation is the small engine,
402 gasoline motor, which is used mainly as a water-lifting device for
irrigation purposes. In 1950 only five small motors were found in
177 Bang Chan. Twenty-one per cent of the respondents in the 1955
survey, however, report owning these motors; the majority of the
*178 respondents (68 per cent) claim to have used this labor-saving
device which is sometimes jointly owned by more than one house-
[241] hold and is frequently loaned out.**

2. Straw mushroom growing. Three years ago the com-
244 mercial growing of mushrooms in Bang Chan was unknown. By 1955,
the practice of growing mushrooms had reached into many homes
434 (44 per cent of the respondents report that they have engaged in
this activity***). Even if no mushrooms have ever been grown in
*177 a given household, it is still likely that the individuals in it
*178 are aware of the practice and have observed it closely through
the mushroom growing activities of their friends, relatives, and
neighbors (reported in 43 per cent of the households). Only a
few households (13 per cent) report that they have never grown
mushrooms or have never been exposed to it in this way.

One advantage in the culture of straw mushrooms is that it permits quickly realized returns. The cycle, from sowing spores in moistened straw to harvesting the mushrooms, takes about two to three weeks. Another advantage is that there is relatively little heavy work or investment required besides the acquisition of straw and spores. A third advantage is a ready market, for the plant is sought by Chinese dealers in Bangkok who supply hotels and restaurants. Bang Chan rice farmers who engage in mushroom growing as a sideline activity sell it either to local middlemen or directly to the Chinese in Bangkok.

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[113] * Sharp, L., H. M. Hauck, K. Janlekha, and R. B. Textor. Siamese Rice Village, A Preliminary Study of Bang Chan. Thailand, Cornell Research Center, June, 1953.

[125] ** The questions: "Do you own a small engine motor or not? (If "NO"): Have you ever made use of one in your work?"

[125] *** The question: "Have you ever grown mushrooms, or not?"

3. Tilapia raising. In 1951, FAO suggested to the Thai Government that cultivation of tilapia be encouraged to help meet the rising need for fish in Thailand. Tilapia is a species of fish which multiplies and grows relatively fast. The strain, which came originally from Africa, is popular in Malaya and was expected to be easily marketable, thus a source of added income in Thailand. The Thai Government followed the FAO suggestion in 1952: a few Bang Chan residents dug the special pools required for the fish culture and began to raise tilapia mainly for commercial purposes. About a third (31 per cent of the households*) reported in 1955 that they have engaged in this activity. 177* 178* 228

From discussions with the people it appears that they are learning by trial and error to raise tilapia. Though fish culture is, for them, mainly a sideline activity, nevertheless, it requires the building of a special dam, care in preventing other fish from devouring young tilapia and maintaining the appropriate balance of fresh water in a given pool. The loss resulting from the fish dying or being eaten by others is relatively high. Although tilapia multiply rapidly, the cash return is not as great as that realized from mushroom growing. The cycle of raising tilapia lasts about four months. [434]

4. Artificial fertilizer. Artificial fertilizer has made its appearance in Bang Chan only recently. Informants in the community reported that only two farmers had tried artificial fertilizer in 1952. In the 1955 survey, 12 per cent of the farmers reported that they have used fertilizer or are using it. This fertilizer is mainly ammonium sulphate sold both by the government and commercial distributors. Only a few farmers (3 per cent) have ever employed it for all, or for the larger part of their fields. The remainder (9 per cent) have used it on a trial basis in only a small part of their fields.** 241 177* 178*

Fertilizer, then, has been tried out on a much smaller scale than either mushroom growing or raising tilapia. Apparently two important barriers operate against its wider acceptance. First, its high cost and the difficulty of purchase and transportation (66 per cent of farmers with ideas on the subject gave these reasons for not using fertilizers); second, popular opinion in Bang Chan declares that artificial fertilizer is not fit for low lands since it washes away and is thus waster (29 per cent of the farmers with ideas on the subject advanced this as reason for not using fertilizer). In addition, fertilizer yields delayed returns.

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* The question: "Have you ever raised tilapia, or not?" [125]*

** The question: "Have you ever used fertilizer or not? .. To what extent have you used fertilizer on your fields?" [125]

743 B. Institutional Care of the Sick: Equally important as agricultural innovations in raising the level of living of an area
#177 such as Bang Chan are the efforts to improve the health and wel-
#178 fare of the population. Since the thirties there has been a clinic in the neighboring market town of Minburi and some Bang Chan farmers used clinics and hospitals in Bangkok before that time. Only about a third (34 per cent) say they have never been to a clinic or a hospital; over a third (37 per cent) have themselves gone for treatment; about one fourth (23 per cent) report having brought a patient there; over one tenth (12 per cent) say they visited relatives there; and a few (3 per cent) say they went there for various other reasons.*

ANALYSIS OF DATA ON AGRICULTURAL INNOVATIONS

121 The central question to which the present analysis directs itself is: What are some of the factors which may be said to account for the fact that certain members of the community are willing to try out these innovations and to continue using them, while others are unwilling even to make the initial attempt? Is there some general pattern to be discerned among the several innovations? Is there any discernible clustering among them; that is, are some community members more "innovation-minded" than others, in the sense that if they try out or accept one innovation they are more likely to accept another? Or are these innovations accepted independently of each other? The following analysis of the survey responses attempts to shed some light on these and related problems.

Factors in Acceptance of Agricultural Innovations

241 Use of the small motor is basic to acceptance of other agri-
402 cultural innovations. Although only a minority of the persons of Bang Chan report that they own a small motor, many more used this
#177 machine through joint ownership or borrowing. Indeed, knowing whether a person owns or uses such a motor is a useful indicator
#178 of his readiness to accept other agricultural innovations. If he owns or has used a motor, then he is about five times more likely than others to try fertilizer, about two and a half times more likely to try raising tilapia, and about one and a third times more likely to try straw mushrooms.

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[125] * The question: "Have you ever been to a clinic or hospital...? In what various places...? For what various purposes did you go ...?"

6: Goldsen and Ralis Z-4.5 (1955) 1957

AO7 Central Thai AO7

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TABLE 1. THOSE WHO OWN OR USE SMALL MOTOR ARE MORE LIKELY THAN OTHERS TO TRY OTHER AGRICULTURAL INNOVATIONS (FARMERS ONLY)

	Owns motor	Does not own motor but uses it	Neither owns nor has used motor
(Total cases)*	(70)	(150)	(108)
Have you ever used fertilizer?**			
Yes	18%	16%	3%
No	82	84	97
Have you ever raised tilapia?			
Yes	53%	29%	22%
No	47	71	78
Have you ever grown mushrooms?			
Yes	48%	49%	37%
No	52	51	64

* The bases on which per cents are computed appear in parenthesis at the head of each column in this and subsequent tables. Actually the bases vary by a few cases, table to table, since there were always a few respondents who did not answer a given question or whose answers were unclassifiable. [125]

** Asked of farmers only. The bases are:

Owns motor	65
Does not own motor but uses it	141
Neither owns nor has used motor	82
NA	3

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177*
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There is some evidence, then, that if a person is willing to try out one agricultural device, such as the motor, he is more likely to try out other agricultural innovations. However, this "clustering" cannot support the hypothesis that there is something like "innovation mindedness" in general, or that acceptance of any innovation in a series is predictive of acceptance of all other innovations in the same series.

Evidence may be cited to substantiate this contention. In the first place, if such a clustering indeed prevailed, one would expect users of any of these agricultural innovations to be more disposed than others to use, as well, certain non-agricultural innovations, such as hospital or clinic facilities, for example.

There is some justification, then, for the inference that 228
initial adoption of innovations such as fertilizer and tilapia,
which require increased labor, will depend to some extent upon the 244
availability of some labor-saving device (such as the small motor)
which will enable the busy farmer to perform the necessary labor 241
and, perhaps, leave him freer to exercise the care required for
these innovations to be successful. Hence the relatively stronger 177*
relationship among these innovations. An innovation which does
not make these demands, however (such as mushroom growing), is more 178*
likely to find acceptance on its own terms and may thus be less
dependent for its acceptance upon availability of some sort of
labor-saving device.

Innovation and Attitude Towards It

There is further evidence in the survey substantiating the 177*
greater "autonomy" so to speak, of the decision to try mushroom 178*
culture compared with the decision to try fertilizer or tilapia. 241

The present study tested the hypothesis that use of these 244
innovations would be related to a favorable attitude toward them. [121]
Attitude toward the four innovations was determined by examin-
ing responses to the questions: "What is your opinion about [125]
fertilizer?" "...about mushroom growing?" "...about tilapia?"
Responses were classified according to whether they revealed
positive, mixed, or negative affective feelings to each of the
innovations.

In general, positive attitudes towards all these innovations are widespread in Bang Chan. About three-quarters of the residents express positive feelings toward mushroom growing and over half express positive attitudes to artificial fertilizer and tilapia raising. (See Table 3.) None of these innovations elicits widespread expressions of disfavor, although the respondents are more likely to express an unfavorable attitude to tilapia (29 per cent) than to fertilizer (14 per cent) or to mushrooms (7 per cent)

TABLE 3. THE MAJORITY IN BANG CHAN HOLD POSITIVE ATTITUDES TOWARDS AGRICULTURAL INTRODUCTIONS

	"What is your opinion about..."		
Attitude	Mushrooms	Fertilizer	Tilapia
Positive	76%	59%	57%
Neutral or mixed*	6	3	2
Negative	7	14	29
No opinion	9	16	8
Not ascertainable	2	8	4
Total cases	(333)	(333)	(333)

* The neutral or mixed attitude category comprises responses conveying partly favorable and partly unfavorable feelings such as, "some kind is good, some kind is not so good"; "in some ways I like it, in some ways I dislike it."

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228 241 Now let us examine the extent to which the decision to try out the innovation is linked to a positive feeling towards it. The decision to try fertiliser and to raise tilapia turned out to be indeed linked with positive feelings towards these innovations. Among those favoring fertiliser, the proportion using it is six times as high as those with neutral, mixed or negative attitudes (18 versus 3 per cent); among those with positive attitudes to tilapia raisers of this fish are twice as frequent in comparison with those having neutral, mixed, or negative attitudes (43 versus 22 per cent). These relationships are shown in Table 4 below.

TABLE 4. ATTITUDES TO FERTILIZER AND TILAPIA RAISING ARE LINKED TO THEIR USE

	Attitude	
	Positive	Neutral, Mixed & Negative
Fertiliser		
Tried it out	18%	3%
Never did	82	97
Total cases*	(168)	(55)
Tilapia		
Tried it out	43%	22%
Never did	57	78
Total cases	(191)	(104)

[125] * Based on responses made by 293 farmers who expressed a codable attitude to fertiliser.

244 *177 *178 On the other hand, the data revealed no relationship between attitude to mushroom growing and growing them. The proportion of users and former users among those who have favorable attitudes and those who have negative attitudes remains relatively constant. Table 5 shows that among respondents with positive attitudes, 47 per cent have tried mushroom growing; while among respondents with negative attitudes, 42 per cent have done so; percentage differences are statistically insignificant.

TABLE 5. ATTITUDES TO MUSHROOM GROWING SHOW NO RELATION TO ITS ADOPTION

	Attitude	
	Positive	Neutral or Negative
	(252)	(42)
Tried mushrooms	47%	42%
Never did	53%	58%

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*177

228 mushrooms. The following section searches for sociological factors linked to these decisions. For example, are the well-to-do farmers* more apt than the less well-to-do to adopt agricultural innovations?
241 To what extent is literacy a factor in acceptance of innovations?
244 To what extent do differences in literacy, communications habits, cultural contacts and urban orientation account for tendencies to adopt or reject these changes?

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[125]* The following analysis has been made, in most cases, for male farmers only. The distribution of initial acceptance among the three groups of male farmers, females, and male non-farmers is given in the following table.

*179
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TABLE 6. USE OF AGRICULTURAL INNOVATIONS AMONG THREE GROUPS OF BANG CHAN VILLAGERS

	Male Farmers (211)	Male Non-farmers (83)	Females (32)
Tried motor	71%	61%	68%
Didn't try	29	39	32
Tried mushroom growing	46%	35%	41%
Didn't try	54	65	59
Tried tilapia raising	35%	25%	31%
Didn't try	65	75	69
Tried fertilizer	15%	5%	**
Didn't try	85	95	

** Asked of farmers only.

It is apparent, as one would expect, that it is mainly the farmers who try these innovations. Relatively few women (with the exception of tilapia raising) and even fewer non-farmers say they have tried them. Since the absolute number of acceptors among women and non-farmers is too small to bear the separate treatment which would be essential to analyze the factors influencing the use or non-use of innovations, they have been excluded from the following presentation, which refers, thus, to male farmers only.

Economic Level

It could be, of course, that people on a higher economic level are in a better position to try agricultural innovations, since they might more easily afford not only an initial cost but also possible loss in trying out something new. 177^{a} 178^{a} 241

The survey data provide several indicators of economic level. Among other questions on this subject, all respondents were asked: "Here in your household how many buffaloes do you own?" About one-quarter reported owning no buffaloes at all; a little more than that proportion reported owning four or more; the median number of buffaloes reported was between two and three. 434 [125] •

In Bang Chan buffalo are an indication of wealth, as is the amount of land planted to rice. Thus all farmers in the sample were also asked, "Last time you planted rice, how many rai* of rice did you plant?" About a third reported that they planted 19 rai or less; about one-fourth reported that they planted 40 rai or more; the median number of rai reported was 26.3. 177^{a} 178^{a} 231 243

If the reported number of buffalo owned is an adequate measure of economic level, then one would expect a high correlation between reported buffalo ownership and reported number of rai planted. If the expectation is borne out by the survey data the two indices may be used interchangeably. (Table 7 reports this relationship for the male farmers in the sample.) 434 [125]

[462]

TABLE 7. FARMERS# WHO OWN MORE BUFFALOES ARE MORE LIKELY TO CULTIVATE LARGER LAND HOLDINGS

"...how many buffaloes do you own?"

"...how many rai of rice did you plant?	None, one or two (99)	Three or more (112)
Less than 9	31%**	11
10-19	32	7
20-29	18	17
30-39	15	23
40-or more	3	41

# Male farmers only
** Percentages may add to 99 or 101 owing to rounding of figures.

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* A Thai land measure; 1 rai = 0.4 acres.

This table shows that in tilapia raising both factors operate 177 *
independently and cumulatively, i.e. people who are better off
economically and who also own or use the motor are almost two 178 *
and a half times as likely to raise tilapia as their economically
depressed counterparts who neither own nor have access to the 228
motor. (45 versus 17 per cent respectively.)

241

The link between use of the motor and attempt to try ferti-
liser holds regardless of economic level. 244

The initial link between ownership or use of the motor and 402
growing of mushrooms, on the other hand, is shown to be a condi-
tional one. Those on a higher economic level are more likely 434
than others to try mushroom growing, whether or not they own or 556
use a motor. Those on the lower economic level, with access to
a motor are more likely to take up tilapia culture.

TABLE 9. RELATIONSHIP OF USE OF MOTOR AND OTHER INNOVATIONS TO ECONOMIC LEVEL

	Economic Level			
	High*		Low**	
Owns or used motor (Proportion who have raised tilapia)				
Yes	45%	(69)	33%	(57)
No	25	(21)	17	(40)
Owns or used motor (Proportion who have tried fertiliser)				
Yes	20%	(69)	18%	(57)
No	5	(21)	*	(40)
Owns or used motor (Proportion who have tried mushroom growing)				
Yes	60%	(69)	36%	(57)
No	37	(21)	23	(40)

* Three buffaloes or more
** Two buffaloes or fewer

[231]

Literacy

121

One important hypothesis to account for differential accep-
tance of innovations is that the decision to try them out is
aided by exposure to the available sources of information. If this
were indeed the case, then users of these innovations will be more
apt to be able to read and write than be illiterate.

Literacy was determined by asking each respondent whether 125 •
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125 he could write, could only sign his name, or could do neither.
Those who said they could write a letter are considered here to be
212 literate. All others are grouped together as illiterates or on a
low level of literacy.

212 The literacy rating was tested for validity as follows: in
Bang Chan literacy is known to be related to age. Ever since
1935** there has been a school in the community. Since that date
872 school attendance has been compulsory. Attendance has been fairly
125 full for the last twenty years, but most older residents have
never had the opportunity for formal schooling.

212 The survey data reflect this correlation between literacy and
age. Among farmers under 40 years of age, only 16 per cent were
*177 rated as illiterate or barely literate by the survey criterion;
while 59 per cent of those of 40 years or older are rated as il-
*178 literate. Thus one can have reasonable confidence in the survey
responses as a rating of literacy.

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TABLE 10. LITERACY OF FARMERS DECREASES WITH AGE

	Age	
	Under 40 yrs.	40 yrs. or more
Literacy		
Illiterate	16%	59%
Literate	84	41
Total cases	(79)	(131)

*177 Literacy is linked discernibly to acceptance of the motor and
mushroom growing. The proportion of literate farmers who have
*178 tried the motor is twice as high as the corresponding proportion
among those who are illiterate. It is less strongly linked to the
228 decision to grow mushrooms, and is, at best, weakly linked to the
decision to raise tilapia or to use fertilizer.

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244

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212 * In addition, interviewers asked respondents who said they
could write to demonstrate it by writing something on the ques-
402 tionnaire.

[125] ** See *Siamese Rice Village*, *op. cit.*

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[125]

TABLE 21. INCIDENCE OF MOTOR USE IS HIGHER AMONG VILLAGERS WHO REPORT WIDER SOCIAL CONTACTS

	Social Contacts ("...Do you have more close friends than most people around here, or about the same as most people around here, or fewer close friends than most people around here?")	
	"More" or "the same" (143)	"Fewer" (53)
Motor		
Has used it	77%	55%
Never did	23	45
Tilapia		
Has tried it	39%	21%
Never did	61	79
Fertilizer		
Has used it	16%	11%
Never did	84	89
Mushrooms		
Has tried them	49%	40%
Never did	51	60

Once again, however, when this link between breadth of social contacts and use of the innovations is examined separately for the literate, compared with the illiterate farmers, we find further substantiation of the previous finding that under certain circumstances contact may act as a substitute for literacy in acceptance of complex innovations. For, although the link between social contacts and use of tilapia remains constant for literate as well as illiterate farmers, it is mainly for those who are illiterate that exposure to wider local social contacts is associated with greater incidence of motor use. [212]

*178
426
402 One is tempted to speculate about the significance of this relationship. One possibility deserves further investigation if the data were only available. If one important reason for incurring debts is to secure or to replace capital equipment, then those farmers more willing to make a capital investment, even though they incur a debt, are more likely to use the motor. Conversely, farmers unwilling or unable to contract debts for a basic improvement in their capital equipment might be the ones less likely to adopt an innovation such as the motor.

Other Factors

121 A number of other factors which conceivably might have been expected to differentiate those who tried out these innovations from those who never made an attempt to use them were investigated and proved to have no differentiating power. Factors such as age and family size, for example, were examined to see whether differential acceptance existed among younger compared with older age groups, or small as compared with large families. No such differences appeared. In the same way, the survey's rough measures of community integration and identification, certain religious beliefs and superstitions, certain personality traits, of knowledge of political figures, and willingness to perform industrial work likewise revealed no differential rates of acceptance when groups were compared.

*178

USE OF MODERN HEALTH FACILITIES

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75 Improvements in agricultural production must certainly not be viewed as the only efforts worthy of attention to raise the level of living in Bang Chan. Equally important are efforts to train the population to use modern health practices and facilities.

Hospitals have been available since the twenties in Bangkok and a clinic in Minburi since the thirties. Despite these facilities, much curing continues in the traditional way through priests or certain farmers of the locality who have learned from other practitioners to compound medicines, set bones, deliver babies and expel demons.

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[125] In the present survey the majority of respondents reported that they have sometimes in their lives used hospital or clinic facilities. To the question, "Have you ever been to a clinic or hospital?" 63 per cent answered affirmatively. Less than half of those who replied indicated having gone for their own treatment or hospitalization, the remainder for other reasons. The distribution of responses is given below.

178*
743
[125]

"Have you ever been to a clinic or a hospital? (If yes) For what various reasons?

No, never went	37%	
Yes	63	
For treatment or hospitalization		37*
To bring a patient there		23*
To visit relative(s) or friend(s)		14*
Other reasons		3*

* These responses should not be cumulated since some respondents reported more than one reason for going.

If, indeed, the responses to this question are to be considered a valid index, one would expect respondents who reported having used these facilities also to report a higher incidence of visits to Bangkok, where the available hospitals are located. This expectation is confirmed by the responses to the two relevant questions.

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TABLE 25. INCIDENCE OF TRIPS TO BANGKOK IS HIGHER AMONG RESPONDENTS WHO REPORT VISITS TO CLINIC OR HOSPITAL

"In the past year, how many times did you go to Bangkok...?"	Have you ever been to a clinic or a hospital?"		
	Yes, for treatment (123)	Yes, for other reasons (91)	No (118)
Ten or more times	32%	31%	17%
Two to nine times	40	37	29
Once	13	12	23
Never	15	20	30

The present study now asks what factors are associated with use of modern health facilities.

Demographic Characteristics of Hospital Users

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It is important to answer one question in advance of more detailed analysis. Does an affirmative reply to the question, "Have you ever been to a hospital or clinic" measure need for medical care rather than acceptance of modern health practices.

No direct measure is available of the actual state of health of the survey respondents. But, assuming that older people need medical care more than younger people, then we have an indirect index of whether or not hospital use is higher among people of advanced age. The data show no such relationship.

APPENDIX A

March 1956

HOW THE BANG CHAN SURVEY WAS CONDUCTED

How the Study Came to be Made

121 The survey conducted in May 1955 was part of a program* for testing diverse techniques of data-gathering in cultures substantially different from U.S. and Western European cultures, where the survey method of gathering data had been developed and tested.

114 The survey questionnaire was developed and the field work carried out with the help of area specialists of the Cornell Research Center in Bangkok. Mr. Robert B. Textor and Mr. Loobonge Sotabhaya of the Cornell Thai staff assisted the field director and recruited the English-speaking Thai university students who interviewed for the survey.

The Questionnaire

12 After a period of training interviewers about the questionnaire and techniques of interviewing, the questionnaire was pretested in a rural community near Bang Chan. Then the staff, consisting of the field director, his deputy, and five Thai interviewers, among them one woman, moved to Bang Chan to carry out the survey.

124 125 Thai and English-language versions of the schedule were drawn up, but of the 335 interviews conducted in the survey, the overwhelming majority was conducted in the Thai language rather than through an interpreter.

The Interviewers

124 The interviewers were a mixed group: one Thai-speaking American anthropologist; one trained Thai anthropological field worker; two Thai Christians (one a theology, the other a medical student); one Thai Buddhist medical student, one Thai Buddhist female social worker; and an American sociologist who used the Thai interviewers as interpreters.

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[122] * The Cornell Cross-Cultural Methodology Project for the Development and Testing of Improved Methods to Study Underdeveloped Areas is supported by a grant from the Rockefeller Foundation and is a project in the Department of Sociology and Anthropology.

On the average, an interview took about 40 minutes. Interviews ranged from about 20 minutes to one and a half hours. During the first days of interviewing the duration of an interview was on the average a little longer, and decreased as the interviewers became familiar with the instrument. For the first four days of interviewing, the daily output of interviews amounted to an average of 23; from the fifth day on the daily average output increased to 32 interviews. 124

The survey focussed mainly upon factors associated with the acceptance or rejection of certain changes in the village. The questionnaire was designed to permit: (1) a check on whether a question was meaningful to the respondents in the sense of its analytic significance in the study design; (2) testing the relative analytic sensitiveness of different types of question and answer categories; (3) collecting data whose manifest content was identical to content which had been investigated in other field stations; (4) collecting data, which, while differing from the manifest content covered in other field stations, nevertheless, had the same conceptual significance in this particular culture analysis; and (5) collecting specific information of interest to the area specialists assisting the Methodology Study. 125

Sampling

Problems of sampling were minimal. The entire area previously studied by Cornell anthropologists, consisting of seven hamlets, constituted the universe from which respondents were to be selected. The sampling unit was a household, defined as a single person or a group of persons constituting an economic unit and customarily using the same kitchen. Interviewers were instructed to select the head of the household as respondent. The head of the household was defined as that resident whom other members considered to be the head. If the head of the household was unavailable, interviewers were instructed to substitute "an articulate member of the household," defined as a person in a given household eligible to substitute as head. The majority of the respondents (85 per cent) were the actual heads of their households; substitutions were made only in the remaining 15 per cent of the cases. Interviews were gathered from all but one of the 336 households in the Bang Chan area studied.

The sample obtained is composed of 243 males and 90 females, of 298 Buddhists and 35 Moslems. As far as ascertainable, the respondents reported their place of birth as follows: 125
621

140 were born in Khanhojaov Commune
116 were born in Bang Chan Commune
11 were born in Minburi Commune
30 were born outside of the three above communes

60

125
621 The age breakdown of the sample is as follows:

41 cases of 20 to 29 years of age
75 cases of 30 to 39 years of age
85 cases of 40 to 49 years of age
68 cases of 50 to 59 years of age
41 cases of 60 to 69 years of age
16 cases of 70 years or more

The occupational status breakdown is as follows:

269 farm operators
24 farm laborers
18 in trade or commerce
10 in service occupations
12 other (2 retired, 2 artisans, 1 traditional doctor,
1 janitor, 1 air force man, 1 policeman,
1 children's caretaker 1 gardener,
1 laborer in irrigation department, and
1 occupation unspecified)

123 Respondent Reaction to the Survey

The respondents were in general cooperative and congenial as is substantiated by the following interviewers' ratings:

(1) 93 per cent of the respondents were reported as cordial at first contact;

(2) 96 per cent of the respondents were reported friendly, cooperative, and responsive for all or most of the interview;

(3) 90 per cent of the respondents were reported as speaking freely for all or most of the interview,

(4) 91 per cent were reported as answering to the point of most or all questions, as giving reasonable, applicable answers;

(5) Only 5 per cent of the respondents were reported as giving many guarded, insincere or evasive replies, whereas 15 per cent were reported as giving some guarded, insincere or evasive replies; and 80 per cent of the respondents were reported as giving no guarded, insincere or evasive replies.

114 The interviewing period fell in a relatively quiet season between harvesting and planting of paddy. At that time farmers were readying implements and beginning to prepare for harrowing and sowing the seed-beds. The period coincided with a period of university vacation so as to recruit English-speaking interviewers. The morale of the staff was high at all times.

* * * *

APPENDIX B

Cornell Methodology Project
Thailand, May 1955

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BANG CHAN STRUCTURED QUESTIONNAIRE (Frequency Distributions)

A. Ser. No. B. Hamlet and N C. Date of Interview E. Name of Respondent [162]

F. Sex	9.	male	243
	X.	female	90
G. Religious Affiliation	0.	Buddhist	298
	Y.	Moslem	35
H. Main Occupation	8.	Farm operator	269
	9.	Farm laborer	24
	X.	Trade and commerce	18
	Y.	Service	10
	0.	Other, Specify________	12
I. R is HH or not HH	1.	HH	277
	2.	Not HH	56
J. If not HH, relationship to HH	3.	Husband	—
	4.	Wife	41
	5.	Son	10
	6.	Daughter	2
	7.	Father	—
	8.	Mother	—
	9.	Mother-in-law	—
	X.	Other relative	3

[46]

1.a. Were you born in Bang Chan Commune, Kharna Yao Commune, Minburi Commune, or outside?

b. If outside, in what province were you born?

[166]

1.	BC Commune	116
2.	KY Commune	141
3.	Minburi Commune	11
4.	Commune unascertainable	2
5.	Outside BC, KY, Minburi	30
7.	Unascertainable	33

2.a. How old are you?

b. In what zodiac year were you born?

[162]

1.	20 to 29	41
2.	30 to 39	81
3.	40 to 49	85
4.	50 to 59	68
5.	60 to 69	41
6.	70 and over	17

621
• 125
[872]

3.a. Is there anyone from your house who is now attending mattayum school?

1.	Yes	24
2.	No	309

b. Do you have any children who have not yet entered or not yet finished prathom school?

3.	Yes	201
4.	No	128
—	Unascertainable	4

c. IF YES: Do you plan to send any of these children to mattayum school or not, or is it uncertain?

5.	Plans to send	66
6.	Does not plan to send	83
7.	Unascertainable	52

[563]

4. What kind of occupation would please you the most—farming or some other occupation? If some other occupation, what other occupation would please y the most?

1.	Farmer prefers farming	266
2.	Farmer prefers other occupation	25
3.	R. from other occupation prefers his occupation	25
4.	R. from other occupation prefers farming	8
5.	R. from other occupation prefers another occupation	5
6.	Unascertainable	4

5. How is Baana BC-KY in your opinion? Is it a very good place to live, a fairly good place to live, or not such a good place to live?

8.	Very good	71
9.	Fairly good	254
X.	Not so good	4
O.	Unascertainable	4

[276]

6.a. Do you smoke cigarettes or not?

7.	Yes	208
8.	No	118
—	No Answer	7

b. If yes: Would you say that you smoke more cigarettes than most people i BC-KY, less than most people in BC-KY, or about the same as most people in BC-KY?

9.	More	14
X.	Less	68
Y.	About the same	124
O.	Unascertainable	2

7. I understand that, since the last war, there have been, around here, some introductions of new things in the field of rice farming, other farming, gardening, and fishing in order to raise production. What are these various new things?

177*
178*
125
[241]
[402]
[243]
[228]
[244]
[235]
[231]

1.	Fertiliser	9
2.	Small engine	4
3.	New rice seeds	3
4.	Tilapia	98
5.	Other fish, specified	13
6.	Fish, unspecified	80
7.	Mushrooms	45
8.	Poultry	179
9.	Pigs	21
X.	Other, specify	68
0.	Unascertainable	45

8. Here, some farmers got a lot more rice from one rai of land than others got. Generally speaking, what are the various reasons why this is so?

[243]
[433]

1.	Fertiliser	59
2.	Skill of the farmer	63
3.	Quality of the soil	65
4.	Irrigation facilities	125
5.	Type of seed	17
6.	Other reason, specify ____________	53

9.a. When was it more profitable for you to grow rice, this year just finished, or two or three years ago?

[243]
[434]

1.	This past year	131
2.	No difference	57
3.	2 or 3 years ago	62
4.	Unascertainable	25
—	Does not apply	58

b. If 2-3 years ago: If this is so, then it has become less profitable to grow rice. Such being the case, have you done anything to improve the income of your family?

7.	Yes	36
8.	No	25
9.	Unascertainable	1

c. If yes: what various things have you done?

5.	Nothing	4
6.	Mushrooms	6
7.	Poultry	8
8.	Fish (Incl. Tilapia)	5
9.	Fertiliser	
X.	Other, specify ____________	25
Y.	Unascertainable	2

10.a. Do you own a small engine motor, or not?

[402]

1.	Yes	70
2.	No	259
—	No Answer	4

125
[402]

b. If no: have you ever made use of one in your work, or not?

3. Yes	145
4. No	106
5. Unascertainable	8

11. What is your opinion about fertilizer?
(See code at end)

[241]

12.a. IF R IS A FARMER: Have you ever used fertilizer or not?

6. Does not apply	17
7. Yes	32
8. No	232
— No Answer	12

b. IF HAS NOT USED FERTILIZER: For what various reasons have you not used fertilizer?
(See code at end)

c. IF HAS USED FERTILIZER: Have you ever used fertilizer in your seed-beds, or not?

9. Yes	20
X. No	13

d. IF HAS USED FERTILIZER: To what extent have you used fertilizer on your fields? On all your fields, or on the larger part of your fields, or on the smaller part of your fields?

1. On all fields	4
2. On larger part of fields	4
3. On minor part of fields	24
4. Unascertainable	1

13. What is your opinion about mushroom growing?
(See code at end)

[244]

14.a. Have you ever grown mushrooms, or not?

1. Yes	143
2. No	188
— No Answer	2

b. IF NO: Do you have any relatives or relative-like neighbors, who have grown mushrooms or not?

3. Yes	141
4. No	44
5. Unascertainable	4

15.a. What is your opinion about tilapia raising?

[228]

b. Have you ever raised tilapia, or not?

1. Yes	104
2. No	225
— No Answer	4

125
[434]

16.a. ASK ONLY FARMERS: This year just now beginning, will you do anything for increasing your income, outside of rice farming?

3.	Does not apply	13
4.	Yes	162
5.	No	107
6.	Unascertainable	11

b. IF YES: What various things will you do?

[224]
[235]
[228]
[241]

0.	Nothing	3
1.	Mushrooms	42
2.	Poultry	51
3.	Fish (Incl. tilapia)	10
4.	Fertilizer	2
5.	Other, specify______	84
6.	Unascertainable	6

17. ASK ONLY FARMERS:

a. Last time you planted rice, how many rai of rice did you plant?

[243]
[433]

1.	4 rai or less	14
2.	5 to 9 rai	25
3.	10 to 19 rai	49
4.	20 to 29 rai	65
5.	30 to 39 rai	53
6.	40 to 49 rai	32
7.	50 to 59 rai	19
8.	60 to 69 rai	14
9.	70 to 79 rai	2
X.	90 rai or more	—
0.	Unascertainable	20

b. And what was the total yield?

1.	120 tang or less	15
2.	121 to 300 tang	28
3.	301 to 600 tang	59
4.	601 to 900 tang	59
5.	901 to 1200 tang	56
6.	1201 to 1500 tang	25
7.	1501 to 1800 tang	10
8.	1801 to 2100 tang	10
9.	2101 to 2700 tang	7
X.	2701 or more tang	3
0.	Unascertainable	21

c. How about the year before—how many rai did you plant?

1.	4 rai or less	16
2.	5 to 9 rai	19
3.	10 to 19 rai	51
4.	20 to 29 rai	67
5.	30 to 39 rai	53
6.	40 to 49 rai	26
7.	50 to 59 rai	20
8.	60 to 69 rai	13
9.	70 to 89 rai	5
X.	90 rai or more	—
0.	Unascertainable	23

• 125
[243]
[433]

17.d. And what was the total yield at that time?

1.	120 tang or less	20
2.	121-300 tang	14
3.	301-600 tang	62
4.	601-900 tang	64
5.	901-1200 tang	50
6.	1201-1500 tang	23
7.	1501-1800 tang	10
8.	1801-2100 tang	8
9.	2101-2700 tang	7
X.	2701 or more tang	4
0.	Unascertainable	31

e. And how many rai did you plant two years back?

1.	4 rai or less	18
2.	5 to 9 rai	27
3.	10-19 rai	45
4.	20-29 rai	72
5.	30-39 rai	52
6.	40-49 rai	36
7.	50-59 rai	18
8.	60-69 rai	12
9.	70-89 rai	4
X.	90 rai or more	—
0.	Unascertainable	29

f. And what was the total yield that time?

1.	120 tang or less	20
2.	121-300 tang	24
3.	301-600 tang	48
4.	601-900 tang	69
5.	901-1200 tang	38
6.	1201-1500 tang	8
7.	1501-1800 tang	7
8.	1801-2100 tang	5
9.	2101-2700 tang	4
X.	2701 or more tang	1
0.	Unascertainable	69

[243]
[435]

18. ASK ONLY FARMERS:

a. Have the changes in the price of rice during the last two or three year caused you any worry, or not?

7.	Yes	156
8.	No	104
9.	Unascertainable	33

b. IF YES: What are you doing about it?
(See code at end)

[243]

19.a. Do you, at present, have your own home rice mill, or not?

X.	Yes	105
Y.	No	188

b. IF YES: What various things do you do with the polishings?

125
[243]

1. DA as mill not used	3
2. Used for feed	99
3. Used for food	—
4. They are sold	3
5. Other, specify________	3
6. Unascertainable	2

1

c. ASK ALL: During this past year, did your family eat home-milled rice entirely, in major part, in minor part, or not at all?

[262]

7. Entirely	5
8. For major part	51
9. For minor part	78
X. Not at all	199

20.a. As you know, some people have had plenty of chance to learn to read, while others have hardly had any chance. How about you yourself? Are you able to read the Thai language, or haven't you ever had the opportunity to do any reading?

[212]

1. Yes, can read	224
2. No	109

b. IF R CAN READ: Would you say it is hard for you to read, or easy, or about medium?

3. Hard	25
4. Easy	85
5. Medium	114
6. Unascertainable	—

c. ASK ALL: Now how about writing? How is it with you yourself? Are you able to write Thai, or haven't you ever had the opportunity to do any writing?

7. Yes, can write	227
8. No	106

d. IF R CAN WRITE: How much writing do you do? Are you able to sign your name, or can you also write a letter?

9. Sign name only	63
X. Can write letter	163
0. Unascertainable	1

21.a. Suppose there were a factory in Minburi paying 20 ticals per day. Would you apply for a job to work in this factory?

[464]

7. Yes	162
8. No	159
9. Unascertainable	12

b. Do you think that someone else from your house would apply for a job there?

X. Yes	105
Y. No	211
0. Unascertainable	17

125

[789] 22. Have you consulted with a medium frequently, occasionally, seldom, or never?

1.	Frequently	7
2.	Occasionally	6
3.	Seldom	64
4.	Never	256

[775] 23. Have you been disturbed by a ghost frequently, occasionally, seldom, or never?

5.	Frequently	6
6.	Occasionally	8
7.	Seldom	35
8.	Never	284

[641] 24.a. Excuse me, could you tell me, who is now the prime minister of Thailand? If you know, could you please tell me his name?

1.	Correct answer	193
2.	Incorrect answer	29
3.	DK, cannot recall	111

b. Excuse me, could you tell me, who is now the chief of police of Thailand? If you know, could you please tell me his name?

4.	Correct answer	167
5.	Incorrect answer	24
6.	DK, cannot recall	142

25.a. IF R LIVES IN BC COMMUNE: Who is the district officer in Minburi? If you know, could you please tell me his name?

1.	DA, as from Bangkapi	194
2.	Correct name of present DO	9
3.	Correct name of past DO	—
4.	Incorrect name	16
5.	DK, cannot recall	111
—	No Answer	3

b. IF R LIVES IN KY COMMUNE: Who is the district officer in Bangkapi? If you know, could you please tell me his name?

6.	DA, as from Minburi	141
7.	Correct name of DO	10
8.	Incorrect name	—
9.	DK, cannot recall	154
—	No Answer	28

[434]
[829]
[556]

26.a. Throughout the world and here in Bang Chan-Khanna Yao too, it is common among men that there must be some who are rich and some who are poor and some who are neither rich nor poor. How about you yourself? Are you rich, or poor or neither rich nor poor?

1.	Rich	2
2.	Poor	68
3.	Neither	263

b. IF POOR: Here in BC-KY, do you think there are many or few people who are poorer than you?

5.	Many	30
6.	Few	31
7.	Unascertainable	7

B

125 •
[592]

27.a. Excuse me, but at present do you have a (wife/husband) who lives and eats with you, or not?

1.	Yes	255
2.	Yes, qualified ______	6
3.	No	72

[589]
[586]

b. IF NO: Excuse me, but is this because you are widowed, separated, divorced, or is there some other reason?

4.	Widowed	45
5.	Separated	9
6.	Divorced	1
7.	Other, specify	10
—	No Answer	7

[592]
(162]

28.a. Your own children, all of them that have ever been born, how many are there?

8.	None	24
9.	One	32
X.	2 to 3	70
Y.	4 to 5	74
0.	6 or more	133

b. How many of your children are still living?

0.	None	37
1.	One	40
2.	2 to 3	63
3.	4 to 5	82
4.	6 or more	97
—	No Answer	8

[165]

c. How many of your children have died?

0.	None	198
1.	One	42
2.	2 to 3	58
3.	4 to 5	17
4.	6 or more	9
—	No Answer	9

[793]
[792]

29.a. Have you ever been ordained as a priest, or not?

1.	Yes	187
2.	No	31
—	No Answer	2

[Pali Buddhist (220)]

b. IF NO: In the future, do you want to be ordained as a priest, or not?

3.	Yes	20
4.	No	11

[593]
[162]

c. ASK ALL: How many sons do you have twenty years old or over?

5.	None	176
6.	One	56
7.	Two	29
8.	Three or more	29
—	Unascertainable	43

125 [793] [593] [792] [162]

29.d. IF R HAS SONS 20 AND UP: Of your sons over twenty, how many have been ordained as Buddhist priests, or not?

7.	DA	212
8.	None	22
9.	One	58
X.	Two	25
Y.	Three or more	16

e. Do you have any sons under twenty?

9.	Yes	186
X.	No	108
—	No Answer	37

[793] [782]

f. IF YES: In future, do you want your sons under twenty to be ordained as priests, or not?

Y.	Yes	186
0.	No	—
—	No Answer	2

g. IF YES: But aside from your admirable desire to have them ordained, in your true heart how sure is your expectation? Are you very sure or not very sure, or fairly sure that they will be ordained?

1.	Very sure	140
2.	Not sure	26
3.	Fairly sure	12
4.	Unascertainable	9
	NA	1

h. All over Thailand there are some Thai men who are over 50 but have never been ordained as priests. For what various reasons might this happen?
(See code at end)

[461] 30. Suppose there was some work you could do individually, or that could be done in a small group of two or three, or that could be done in a large group. Which way would you prefer to do the work—as an individual, or in a group of two or three, or in a large group?

8.	Individually	60
9.	Small group	55
X.	Large group	202
Y.	Undecided, depends	4
3.	Unascertainable	12

[572] 31. Around here in TC-KT there are some people who have many close friends and there are other people who have few close friends. And how about yourself? Do you have more close friends than most people around here, or about the same as most people around here, or fewer close friends than most people around here?

5.	More than most	62
6.	Fewer than most	56
7.	About the same	154
8.	Unascertainable	61

125

32. Last night, when you ate at your own house, did you eat with your hands, with fork and spoon, or with spoon alone? [264]

9.	Hands	242
X.	Fork and Spoon	11
Y.	Spoon alone	73
0.	Unascertainable	7

33.a. Have you ever been to a clinic or a hospital? [743]

1.	Yes	214
2.	No	119

b. IF YES: In what various places?

3.	Minburi	156
4.	Bangkok	135
5.	Other place	7
6.	Unascertainable what place.	

c. IF R HAS BEEN TO CLINIC OR HOSPITAL: For what various purposes did you go?

7.	Treatment or hospitalization	123
8.	To bring a patient there	77
9.	Visit relatives or friends	45
X.	Other reason, specify______	11
0.	Unascertainable	—

34.a. During the last year, did it occur to you frequently, sometimes, or never that you had difficulties falling asleep? [513]

1.	Frequently	73
2.	Occasionally	151
3.	Never	109

b. During the last year, did it occur to you frequently, sometimes, or never that you had a headache? [164]

4.	Frequently	50
5.	Occasionally	174
6.	Never	109

c. During the last year, did it occur to you frequently, sometimes, seldom or never that you lost your appetite?

7.	Frequently	50
8.	Occasionally	173
9.	Never	110

d. During the last year, did it occur to you frequently, sometimes, or never that your hands trembled so as to bother you? [164]

X.	Frequently	17
Y.	Occasionally	93
0.	Never	218
—	No Answer	5

e. During the last year, did it occur to you frequently, sometimes, or never that your heart beat so fast as to bother you?

1.	Frequently	36
2.	Occasionally	154
3.	Never	141
—	No Answer	2

125
[513]

f. During the last year, did it occur to you frequently, sometimes, or never that you had a nightmare?

4.	Frequently	16
5.	Occasionally	120
6.	Never	197

[546] 35. In your life, how many times have you seen a movie, or haven't you ever seen one?

5.	Ten times and more	161
6.	4 to 9 times	60
7.	1 to 3 times	75
8.	Never	33
—	No Answer	4

[426] 36.a. Excuse me, I'd like to ask about a problem common in rural places all over the world. Do you now have a debt or not?

5.	Yes	192
6.	No	140
7.	Unascertainable	1

b. IF YES: Is your debt now higher, or lower, or about the same as it was two years ago?

8.	Higher	68
9.	Lower	95
X.	About the same	28
Y.	Unascertainable	1

c. IF NO: How about two years ago, did you have a debt then or not?

9.	Yes	61
X.	No	78
Y.	Unascertainable	—
—	No Answer	1

[441] 37.a. Do you or anybody in your household buy certain products in order to resell them at a profit?

9.	Yes	85
X.	No	242
Y.	Unascertainable	2
—	No Answer	4

b. IF YES: Do (you/they) sell things regularly, occasionally or just at festival times?

7.	Regularly	31
8.	Occasionally	49
9.	Just at festival times	5
X.	Unascertainable	—

[241] 38.a. And now, I would like to know a little more about fertilizer. Do you think fertilizer is very good, fairly good or bad?

1.	Very good	106
2.	Fairly good	149
3.	Bad	15
4.	Unascertainable	63

b. And how about mushroom growing? Do you think mushroom growing yields very good money, good money, or little money?

125
[244]

5.	Very good money	68
6.	Good money	160
7.	Little money	19
8.	Unascertainable	56

c. And what about Tilapia. Do you think tilapia raising pays very good money, or good money, or little money?

[228]

9.	Very good money	15
X.	Good money	73
Y.	Little money	175
0.	Unascertainable	70

39. Do you believe in mediums strongly, somewhat, or not at all?

[787]

1.	Strongly	12
2.	Somewhat	192
3.	Not at all	105
4.	Unascertainable	24

40.a. Suppose you could do the same work in another rural place and earn ½ more than here. For example, it would be a place 100 kilometers from here. Would you be willing to leave for that place or not?

[166]

5.	Yes	118
6.	No	203
7.	Unascertainable	12

b. IF NO: For what various reasons would you not be willing to go?
(See code at end)

41.a. If you had no land to work in BC-KY would you move to another place or not?

X.	Yes	166
Y.	No	112
0.	Unascertainable	20
—	No Answer	35

b. IF NO: For what various reasons?
(See code at end)

42.a. Some people say that, generally speaking people who live in Bangkok have more genuine and lasting happiness than people here in BC-KY. Do you agree or disagree?

[369]
[829]

1.	Agree	136
2.	Disagree	134
3.	Unascertainable	63

b. IF AGREE: For what various reasons do you agree?

If Agreement (See code at end)

125 42.a. IF DISAGREE: For what various reasons do you disagree?

[369] IF Disagreement (See code at end)

[829] [793] [792] 43. Do you agree or disagree that all priests are honest and moral men?

X.	Agree	197
Y.	Disagree	90
0.	Undecided	40
—	No Answer	6

[829] 44. Do you think it is right or wrong for a Thai to marry a Chinese?

1.	Right	55
2.	Wrong	182
3.	Unascertainable	91
—	No Answer	5

[775] 45. Do you believe that ghosts bother people? Strongly, somewhat, or not at all?

4.	Strongly	40
5.	Somewhat	136
6.	Not at all	124
7.	Unascertainable	28
—	No Answer	5

[653] 46.a. During the past year, have there been any activities for the public welfare in BC Wat, or not, to which you contributed labor?

1.	Yes	231
2.	No	102

b. IF YES: For what various activities did you contribute labor?

____

____

c. During the past year or so, have there been any activities for the public welfare in the wat, or not, to which you contributed money or goods?

1.	Yes	264
2.	No	63
—	No Answer	6

[651] d. IF YES; For what various activities did you contribute money or goods?

____

____

47.a. How about activities not connected with the wat or with religious ceremonies in the home. During the past year, have there been any such activities for the public welfare in BC-KY, to which you contributed labor, or not?

1.	Yes	94
2.	No	232
3.	Unascertainable	7

47.b. IF YES: For what various activities did you contribute labor? 125
(See code at end)

[653]

c. During the past year, have there been any public welfare activities, not connected with the wat or with religious ceremonies in the home, or not, to which you contributed money or goods?

1. Yes	128
2. No	197
3. Unascertainable	8

d. IF YES: For what various activities did you contribute money or goods?
(See code at end)

48.a. Have you attended the ceremony of wisaka bucha at Wat BC every year, or only in some years, or only once in many years, or never? [796]

8. Every year	156
9. Only in some years	135
X. Once in many years	21
Y. Never	14
0. Unascertainable	7

b. Have you attended the ceremony of gilding the Buddha's footprint at Wat BC every year, or only in some years, or only once in many years, or never?

1. Every year	225
2. Only in some years	62
3. Once in many years	17
4. Never	9
5. Unascertainable	20

49.a. Excuse me, this is a strange question, but do you own a pair of shoes? [291]

6. Yes	136
7. No	197

b. Of what various materials are your shoes made?

8. Leather	65
9. Cloth, canvass	87
X. Other, specify____________	11
0. Unascertainable	
— No Answer	1

50.a. In your household, is there a hatchet, or not? [412]

1. Yes, hatchet	309
2. No	24

b. (In your household), is there a pressure lamp, or not? [416]

3. Yes, pressure lamp	188
4. No	145

c. (In your household), is there a flashlight or not?

5. Yes, flashlight	271
6. No	61
— No Answer	1

125 [412] 50.d. (In your household) is there a pair of scissors of any kind or not?

7. Yes, scissors	219
8. No	114

[207] e. (In your household) is there a radio or not?

9. Yes, radio	47
0. No	286

[402] f. (In your household) is there a winnowing machine, or not?

X. Yes, winnowing machine	102
Y. No	231

[243] [402] g. (In your household) is there a windmill, or not?

1. Yes, windmill	161
2. No	172

[805] [405] 51. Do you have a wrist watch, or not?

3. Yes	79
4. No	252
— No Answer	2

[231] a. Here in your household, how many buffaloes do you own?

5. None	81
6. One	27
7. Two	67
8. Three	61
9. Four or more	97

b. (Here in your household) how many pigs do you have?

0. None	321
1. One	2
2. Two	2
3. 3 or more	1
— No Answer	7

[235] c. (Here in your household) how many chickens do you have?

4. None	35
5. 1 to 2	7
6. 3 to 4	17
7. 5 to 9	31
8. 10 or more	243

d. (Here in your household) how many ducks do you have?

0. None	208
1. 1 to 2	9
2. 3 to 4	16
3. 5 to 9	58
4. 10 or more	42

125

53. Which of the following six qualities do you feel is the best thing for man: Virile, friendly, educated, rich, religious, lazy? [577]

5.	To be virile	2
6.	To be friendly	31
7.	To be educated	58
8.	To be rich	43
9.	To be religious	126
X.	Not to be lazy	57
Y.	Unascertainable	15
—	No Answer	3

54. Do you drink tea frequently, occasionally, seldom, or never? [272]

1.	Often	22
2.	Occasionally	68
3.	Seldom	158
4.	Never	85

55. Do you drink whiskey frequently, occasionally, seldom, or never? [273]

5.	Often	29
6.	Occasionally	73
7.	Seldom	157
8.	Never	76
9.	Unascertainable	—

56.a. In Thailand are many people who smoke opium. Excuse me, during your life have you ever smoked opium, or not? [276]

1.	Yes	45
2.	No	287
3.	Unascertainable	1

b. IF NO: Excuse me, do you think there is anything wrong with smoking opium. or not?

4.	Yes, it is wrong	281
5.	No, it is not wrong	5
6.	Unascertainable	1

c. IF SOMETHING WRONG: What are the various reasons why you think it is wrong?

7.	Bad for health	43
8.	Habit forming	42
9.	Waste of money	220
X.		
Y.	Other reasons, specify________	40
0.	Unascertainable	

57.a. In the last month, how many times did you go to Minburi or didn't you go at all? [484]

0.	Did not go at all	67
1.	Once	55
2.	2 to 4 times	120
3.	5 to 9 times	39
4.	10 to 19 times	30
5.	20 times or more	20
6.	Unascertainable	8

125
[484]

57.b. IF R DID NOT GO DURING LAST MONTH: How many months ago was the last time you went to Minburi?

7.	Within last 3 months	34
8.	More than 3 months ago	25
9.	Never been to Minburi	1
X.	Unascertainable	3
—	No Answer	4

58. This past year, how many times did you go to Bangkok, or didn't you go at all?

0.	None	71
1.	Once	56
2.	2 to 4 times	90
3.	5 to 9 times	28
4.	10 times or more	87
5.	Unascertainable	1

59. In your l[illegible]fe, how many times have you been to Don Muang Airport, [illegible] haven't you been there at all?

6.	[illegible]e	148
7.	[illegible]e	58
8.	[illegible]o 4 times	72
9.	[illegible]mes or more	52
X.	U[illegible]certainable	3

60. In your li[illegible] how many times have you been to the annual agricultur[illegible] fair or the Agricultural Experimental Station at Bang Kh[illegible], or haven't you been there at all?

0.	None	227
1.	Once	47
2.	2 to 4 times	45
3.	5 times or more	14
4.	Unascertainable	

61. In your life, have you ever been beyond the boundaries of Thailand, or not?

X.	Yes	13
Y.	No	318
0.	Unascertainable	2

62.a. Have you ever lived in Bangkok, or not?

1.	Yes	117
2..	No	216
—	Unascertainable	

[464]

b. IF YES: What various duties or jobs did you have when you lived in Bangkok?

4.	Soldier	37
5.	Police	10
6.	Student	22
7.	Artisan	1
8.	Laborer	23
9.	Other, specify ______	33
0.	Unascertainable	2

125
[166]

62.c. IF YES: What is the total number of months that you lived in Bangkok?

5. One year or less	31
6. 13 to 24 months	30
7. 25 to 60 months (5 yr)	21
8. More than 5 years	35
9. Unascertainable	

[592]
[166]

63.a. Is there anyone now eating and living in your house who once lived in Bangkok, or not?

9. Yes	36
X. No	296
Y. Unascertainable	1

b. IF YES: What is your relationship to this person(s)?

1. Son	9
2. Daughter	6
3. Father	2
4. Mother	-
5. Brother	2
6. Sister	13
7. Other relative	14
8. Unascertainable	-

c. IF YES: At what age did he leave BC?

1. Below 15 years	5
2. 15 to 19	8
3. 20 to 29	15
4. 30 years or more	4
5. Unascertainable	4

d. IF YES: How long did he (she, they) live in Bangkok?

6. Less than one year	5
7. 1 to 4 years	19
8. 5 to 9	6
9. 10 years or more	5
X. Unascertainable	1

64.a. Is there anyone who has previously eaten and lived in your house and who is now working in Bangkok, or not?

1. Yes	92
2. No	241
3. Unascertainable	

b. IF YES: What is your relationship to this person(s)?

4. Son	35
5. Daugnter	21
6. Brother	16
7. Sister	8
8. Other relative	18
9. Unascertainable	—
— No Answer	2

125
[166]
[592]

64.c. IF YES: At what age did he leave BC?

1. Below 15 years	8
2. 15 to 19 years	28
3. 20 to 29 years	50
4. 30 years or more	5
5. Unascertainable	6

d. IF YES: For how long has he (she, they) been gone from BC?

6. Less than one year	12
7. 1 to 4	42
8. 5 to 9	19
9. 10 years or more	19
X. Unascertainable	

[4.64]
[463]

e. IF YES: What various duties or jobs does he (she, they) do in Bangkok?

1. Housewife	17
2. Unskilled laborer	19
3. Skilled laborer	33
Armed forces	17
Service	9
Employee	5
4. Other (retired, selling things)	2
5. Unascertainable	4

{166]
{593]
{602]

f. IF YES: During the last year, have you seen this person(s) several times, once, or not at all?

9. Several times	65
X. Once	16
Y. Not at all	8
0. Unascertainable	3

g. IF YES: Does he (she, they) make regular remittances to this house?

X. Yes	31
Y. No	56
0. Unascertainable	5

[207] 65. Do you listen to the radio regularly, daily, occasionally, seldom, or never?

6. Regularly-daily	45
7. Occasionally	66
8. Seldom	148
9. Never	60
— Unascertainable	14

[525] 66.a. Do you play the lottery regularly, occasionally, seldom, or never?

1. Regularly	20
2. Occasionally	54
3. Seldom	220
4. Never	38
5. Unascertainable	—
— No Answer	1

b. IF REGULARLY, OCCASIONALLY, OR SELDOM: Suppose you were to win the second prize of 40,000 baht. What various things would you do with this money?

(See code)

	Qu 11	Qu 13	Qu 15A
1. Positive, no evidence: very good, good, nice	103	114	77
2. Positive, with evidence: good results, specific statements	47	120	95
3. Neutral or mixed	11	20	6
4. Negative, no evidence: no good, bad, of no use	9	5	15
5. Negative, with evidence: difficult to apply in deep water, must keep using it, too expensive, some results as without fertiliser	33	13	80
6. Positive, qualified: Fertiliser too expensive	13	—	1
7. Positive, qualified otherwise: only for high land; very hard to purchase; requires to keep on using it	32	18	18
8. Respondent states he has no opinion	54	31	26
X. Negative, qualified: It's not quite good, it depends on the soil	4	4	3
0. No answer	4	3	1
9. Respondent's attitude not ascertainable	23	5	11

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241
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228

	Qu 15B
0. D.A.	85
1. Too expensive	78
2. Difficult to purchase	15
3. Not fit for low land	39
4. Soil not suitable	3
5. No ascertainable reason given	28
6. Too little land	7
7. Other reasons	56
8. Have never used it before. Do not now either	12
X. N.A.	105
9.	21

125
241

	Qu 16B
X. N.A. Unascertainable	60
0. D.A.	151
1. Nothing, cannot do anything	70
2. Grow mushrooms	12
3. Raise poultry	15
4. Raise fish (including Tilapia	7
5. Use fertiliser	—
6. Find job as laborers	6
7. Other: try to find new seed, sell vegetables, borrow money from neighbors, keep rice until price goes up, economise, send sons to work	26

125
243
435
458

125
621

		Qu 47C	Qu 41B
1.	Too old to move, old man	33	12
2.	Easy to make living here, more comfortable, happy here	36	8
3.	Loves place, born here, would like to die here	37	26
4.	Doesn't like to leave area	10	4
5.	Relatives are here, likes neighbors, family here	32	20
6.	Own land	19	15
7.	Can't move her house, worried about housing in new place	7	1
8.	Change career, use other occupation	2	18
9.	Other: Big family, had to move too far, wouldn't know how to find a new place, people here one can trust, will help you	39	13
0.	D.A.	130	805
X.	No answer, unascertainable	7	23

125
653

		Qu 47B (labor contrib)	Qu 47D (money contrib)
4.	D.A.	238	202
5.	School	23	51
6.	Bridge	36	36
7.	Canal	16	8
8.	Road	13	23
9.	Other: district office, festival shelter, marriage of neighbors	8	8
0.	N.A.	1	9
X.	Rest house	5	5

125
525

		Qu 66B
1.	Make merit, give alms, buy a golden belt, build a mosque	172
2.	Purchase land	91
3.	Trade, build a market, open rice mill	34
4.	Spend for the family, unspecified, improve group condition	68
5.	Build a house	40
6.	Purchase of farming equipment or stock	22
7.	Pay debt	7
8.		
9.	Other: Offer some to Thai army, to be carpenter, keep money in bank and collect interest, educate children, benefit country	44
0.	D.A.	39
X.	No Answer	2

Question 29.h. Reasons respondents give for why some old men have not served in priesthood (multiple choice replies). 125 •

Immediate deprivation		793
Dependents (worry about family, have wives, they have many children)	78	792
Financial reasons (they are very poor, they have no money, their parents are very poor, in debt)	56	828
Property (worry about property and profession)	15	829
Life situation		
Married too young (too early, have wives early, "fell in love, got married, acquired dependents, so could not get ordained")	50	
Wrong orientation to life (they believe in a wrong way of life, they are lazy and not religious, they pay too much attention to wordly things, they cannot pray, "they don't think of their parents enough, they think only of themselves, and only of the present")	19	
Religious belief system		
Apathy to priesthood (they do not like it, feel indifferent about ordaination, have no intention of being ordained)	43	
Indifference to Buddhism (they are not true believers, they did not participate in religion, "they aren't sons of Lord Buddha," "they don't love their race or Buddha")	19	
Qualification		
Illiteracy, ignorance (they cannot read, they are ignorant, "afraid cannot abide by teachings and discipline," "they cannot read so they are ashamed if they become priest")	21	
Personality (they are ruffians, they are disorderly drinking men, they are poorly brought up, they are not good enough, mental disturbance)	11	
Background		
Lack of parental supervision (their parents can't control them, "nobody would give the advice and so they did not enter the priesthood)	5	
Parental objection ("Some men have quarrels and their parents don't want them ordained," "they cannot receive permission from their parents")	2	
Other reasons ("Because such men did not get ordained in previous incarnation, either," "because he has sinned in the past life and has bad luck in this life," "they have to be soldiers," "they don't know the merit of sin," "they are too old, their merit did not reach the certain point so they did not have the chance," "they have children and sometimes feel ashamed before sons who have been ordained," "they forget")	8	
No Answer	63	
Don't know, unascertainable	37	

125
369
829

Question 42.b. Reasons for Agreement (multiple choice replies)

Amount of effort in earning a living	
Earn living more easily, lighter work, a farmer has to work too hard, life is hard here—easy there	58
Can work indoors, needn't work in sun and rain	13
Other (living is easy if you have money, don't have as many worries as farmers, can trade more easily)	3
Availability of jobs and money	
They have salaries so don't have to worry	11
Earn more money, earn more money for pleasure, earn money more quickly, can make money in commerce	11
They have money, they have properties	10
Can find job more easily	10
Good occupations	1
Convenience	
More comforts	10
They can get everything they want, can get everything easily	7
Can find food more easily, it's more plentiful, food is better	6
They have communication, transportation, water and light	5
Everything is convenient	4
Other (more privacy, children have a better chance for education, many pleasures, better living, no troubles)	5
Other Reasons	
More civilized, they have "knowledge," they can write, they govern the country, Bangkok is progressive, wherever you live you are happy if you behave well	8
No Answer	8

Question 42.c. Reasons for Disagreement (Multiple choice replies)

Cost of Living (Cost of living too high, must spend too much money, everything more expensive, food is expensive there)	34
Availability of jobs and money (Easier to make living here, no way of earning money there, hard to find a job there)	23
Dangers of Bangkok life (Fires, traffic, wars, too much fighting there, cheating, robberies, bandits)	17
No security (Poor people starve there, occupation is not permanent, economically less secure)	14
Urban Atmosphere (It's too crowded, the weather is bad, the air is bad, it's too noisy, too many mosquitoes, no kindness)	14
Integration in Bang Chan, lack of it in Bangkok (Work is harder here—but you have peace of mind, people have no strength or unity there, plenty of friends and relatives here, can live in own house here)	12
Bang Chan is O.K. (There is plenty of food (vegetables) here, life is easier and more convenient here)	9
Specific qualifications needed (Don't have enough knowledge, education, or experience to be happy there, must be a skilled worker)	7

Question 42.c. (Cont'd)

Need for Money in Bangkok (Only happy there when have plenty of money)	6	125 369
Amount of effort in earning a living (Have to work every day there	4	829
Other reasons (Too many poor people there, many illnesses there, the life of the people there depends on the farmer, people from Bangkok always go to the country when anything bad happens, people can be happy both places, different people have different hearts)	12	
No Answer	4	
Don't know	5	

Question 46.b. For what various activities did you contribute labor? 125

Earth work		653
Earth work at Wat	18	
Earth work at Mosque	7	
Earth work, unspecified (digging dirt, filling low places, digging Klong, loading and unloading earth and bricks)	53	
Cement Work		
Cement work at Wat (moved cement bags, laid concrete floor)	12	
Cement work, unspecified (building cement sidewalks, helped make concrete, poured concrete)	14	
Building and Repairs		
Building sala (pavilion, repairing pavilion)	51	
Building mosque (repairing Surao porch)	8	
Built priest house, construction work in wat, latrine in Wat, repair crematorium	9	
Building bridge	21	
Building road	13	
Constructionwork, unspecified (carried posts, repair a building, carpentry)	7	
Services		
At Wat fair (helped cook and serve, helped manage, sweeping)	27	
At Surao fair (helped cook and serve)	3	
Services, unspecified (boiled water, cooked, carried water)	15	
Guilding the gold leaf, miscellaneous labor at footprint guilding festival)	7	
Priest's funeral (cooked, helped at cremation)	7	
Other (served at Katin ceremony, solicited money for Wat)	3	

Question 46.d. For what various activities did you contribute money or goods? 125

To the Wat, unspecified	19	431
Contribution, unspecified	19	651
Construction activities		
To build pavilion (sala), to repair pavilion	57	
To make path, build street on Wat grounds	87	

125
431
651

Question 16.d. (Cont'd)

[796]
[764]

Construction activities (Cont'd)	
To the Wat (to repair Wat, construction in Wat, fixing walls)	27
Contribution for building materials (buy cement, concrete floor, wood and tin, for new cement sidewalks, water tank)	21
To Surao (general fund, repair)	9
To build a bridge	8
To buy a generator	6
To build priest's house bathroom	9
To build preaching hall	3
Ceremonials	
For ceremonies, unspecified	12
To guild the golden leaf	27
To cremation (to build crematorium; to cremate father, people without relatives; to build corpse go-down; priest's funeral)	12
To Wat fair	10
Other (to Katlin, to revise the Buddhist sacred book, to ordain priest, for building Buddha figure, to New Year festival, for dancing girls)	11
To Surao fair	4
Food and related donations	
Gave rice, unspecified	5
Gave rice (food) for Wat, priests	18
Gave rice for Wat fair	7
To buy utensils (including cooking utensils) for Wat	6
To buy utensils for Surao	6
Gave food to Surao	1

APPENDIX C

Cornell Methodology Project,
Bangkok
2 May 1955

Interviewer Guide

Bang Chan Survey 1955

I. INTRODUCTION

121

This survey is a multipurpose study. One of its objectives is to help determine HOW one can best use a technique such as a survey for community research in South East Asian villages. A survey is one of several techniques used in community research by Western social scientists. The study of a community permits to acquire knowledge about what is essential and important in the life of a village and town. Once a store of knowledge is available and described, the door is being opened for the introduction of innovations and improvements based on scientific knowledge and not based on hunches and speculative thinking. However, the instruments of social science research still bear great limitations. Life processes are the laboratory of research. Thus, dynamic processes are found which make research complex.

Another objective of this survey is to study the meaning in a given cultural setting of variations in question wordings, different types of answer categories, and various types of questions in terms of question structure.

Finally, an attempt is made as well to collect some data from a typical rice village in the hinterland of Bangkok for supplementing cultural anthropological hypotheses and findings.

This interviewer guide is to assist the interviewer in his task. Here anticipated difficulties and weaknesses in this survey are brought to light in order to make it easier for the interviewer to avoid traps inherent in field situations. First of all, it should be noted that replies to ALL QUESTIONS ARE REQUIRED. It means that a given number for each question or subquestion must be ENCIRCLED ON THE ANSWER SHEET OR THE RESPONDENT'S REPLY MUST BE REGISTERED IN THE PLACE PROVIDED FOR. Unless strict adherence to this rule is obtained from each interviewer, questionnaires will contain omissions and become valueless. Such questionnaires would signify a loss of effort, a loss of time, and unnecessary exposure of respondents to interviews. Secondly, an interviewer who has any doubts about procedural points, should discuss them without any hesitation either with the field director, or with his deputy, Mr. Textor, or with Mr. Civ, who, all three, consider it their responsibility to clarify all possibly confusing matters and to give such training to each interviewer as to enable him to perform his task with ease. 125
124

124 125 Each interviewer is actually given three instruments to work with: (1) The questionnaire according to which he asks the given questions VERBATIM AND IN THE ORDER INDICATED, (2) The answer sheet on which he registers IMMEDIATELY AFTER EACH QUESTION RESPONSE the obtained replies, and (3) the interviewer checkform which is filled out after the completion of the entire interview, as soon as practicable.

IV. DISCUSSION OF QUESTIONS

The questionnaire consists of 66 questions according to the devised numbering system. Actually, many of the questions are frequently made up to include one or more subquestions. EACH QUESTION REQUIRES AN ENTRY ON THE ANSWER SHEET. However, 28 questions contain subquestions which are conditional. These are to be asked only in the case that a given condition is fulfilled in the response to the main questions. The conditional subquestions carry the following numbers: 3c, 6b, 9 b and c, 10 b, 12 b, c, and d, 14 b, 16 b, 18 b, 19 b, 20 b and d, 26 b, 27 b, 29 b, d, f, and g. 33 b, 36 b and c, 37 b, 40 b, 41 b, 42 b and d, 47 b and d, 49 b, 56 b and c, 57 b, 62 b and c, 63 b,c, d, 64 b, c, d, e, f, and g, and 66 b.

Six questions should be addressed to FARM OPERATORS ONLY. These questions are: 9, 12, 16, 17, 18 and 41. ALL OTHER QUESTIONS SHOULD BE ASKED OF ALL Rs.

The questions are formalited in such a way as to provide certain answer categories. These are: yes-no, agree-disagree, right-wrong, calibrated) multiple choice and open-ended categories. The way to handle these answer categories has been discussed inlength.

At this point, attention is directed to the open-ended reply category, because it is more difficult to deal with. One procedure would be to write down verbatim a response obtained from the R. However, a R. might, at times make a speech and the interviewer would then not be in the position to register all that is said. He would not, furthermore, consider it necessary to register what had been said not connected with the question asked. Therefore, the interviewer would likely to be summing up the response. Such pertinent summaries are most important and frequently made. In this questionnaire, it had been attempted to anticipate the response categories to open-ended questions on the answer sheet to a great extent, as they are likely to fall in given patterns. In such cases, the likely answer categories are found on the answer sheet. On the other hand, open-ended questions remain to be filled in by the interviewer, when lines instead of categories are found on the answer sheet. Here, a verbatim rotation of the R.'s pertinent points is essential. In case of doubt, each interviewer is encouraged to discuss such

125 items the same day with Mr. Tester or with Mr. Civ. As the
124 space provided on the answer might not be sufficient for this purpose, the back page of the interviewer checkform should be used and an asterik should be placed in the space provided for the reply on the answer sheet. It is expected that for these questions one to three line replies would be of normal length. Such replies, posted on the backpage of the interviewer checkform, can be written in Thai and sufficient space should be left between the various notations for an English translation to be fitted in.

Before an item by item discussion of the questions, just two more remarks about probing. Probing is chiefly used in two kinds of situations: (a) when a R. is slow in replying to a question, or seems not to have understood a given question, or when he might try to avoid a reply by stating that he does not know (D.K.) or "does not recall"; in such cases the question or relevant parts of it are repeated verbatim; and (b) when a R. gives an irrelevant answer and the interviewer is prompted to probe with the intention to stimulate a response to the point of the question; here, usually more probing will be necessary than under (a).

6 DO NOT PAY ANY ATTENTION TO THE "CLM." COLUMN NUMBER DESIGNATIONS which follow question numbers on the answer sheet.

Qu. 2: Write in the precise age obtained on the line behind the corresponding age group. Below, you find a table of the zodiac years [illegible]ing from 24 to 73, which will provide you with a check and an adjustment of the frequently approximative age indicated by the R. For instance, assume that a R. says he is 50 years old, when you ask him: How old are you: You then ask him in what zodiac year he has been born. Assuming his reply is "khaan," you then read from below table "53 years" and this is the age which you register in the line behind "50 to 59" age group.

[805] Table of zodiac years

mamee	24, 36, 48, 60, 72	chalua	30, 42, 54, 66, 78
voog	23, 35, 47, 59, 71	khaan	29, 41, 53, 65, 77
rukma	22, 34, 46, 58, 70	tho	28, 40, 52, 64, 76
coo	21, 33, 45, 57, 69	maroong	27, 39, 51, 63, 75
kun	20, 32, 44, 56, 68	maseeng	26, 38, 50, 62, 74
chuad	31, 43, 44, 67, 79	mamia	25, 37, 49, 61, 73

Qu. 6: You ask the R.: Do you smoke and offer him simultaneously a cigarette.

Qu. 7: Some reply to this question is desirable and probing might be at times required. In the case that one reply to the point is obtained, no further probing is necessary. If there is no answer or an answer not to the point, probe once by repeating the question and, if necessary, by adding: You probably can tell me something about the new things.

Qu. 8, 9c, 11, 12 b, 13, 15 c, and 16 b ARE AS WELL QUESTIONS where probing might occasionally be required. When we talk of fertiliser, we have exclusively artificial fertiliser in mind and not manure or compost.

Qu. 17 a, 17 b, 17 c, and 17 d are provided with lines behind the given answer categories on which the figures in rai or tang respectively should be registered in the corresponding place just as you handle this in Qu. 2.

Qu. 18 b: This is perhaps a difficult question for some Rs., as simple as it might look. Probing-eventually the use of a silence period for stimulating embarrassment and response-is recommended, when no fast reply is forthcoming.

Qu. 46 and 47: Pretests have indicated that the concepts of public welfare work and the distinction of what are contributions in connection with the Wat or religious activities and other contributions are not very clear in the minds of many Rs. Proceed according to the principle of sound logic for obtaining replies to Qu. 46 as distinguished from Qu. 47. In these questions some explaining might be exceptionally well justified.

Qu. 58: City limits of Bangkok are defined as follows: Present city limits at Km 11, Lard Prow.

Qu. 62 b and 64 c: Probe for each duty and job. You can consider this like a multiple choice question, as the same R. might refer to more than one duty or more than one job held.

Qu. 66 b: This last question is again an open-ended question of the projective type. It is expected that respondents will have no difficulties in expressing their wishful thoughts. You can probe freely, if need arises.

125

[Information on sampling techniques, methods of scoring, and the usage of control groups have been filed also in the category 128.]

*128 rapport with the villagers even at the expense of certain much needed information, only very informal interviews were made in the first few months during which time no attempt was made at any businesslike questioning. As a result, it was not until May, 1949 that the first of our Bangchan censuses was completed.

125 With scanty background materials, we had, nevertheless, decided to concentrate our effort on the farm operating group at the very beginning. The reason for this approach is simple: it was readily seen that this group was the core of the community.

Since we had only one year for the preliminary study, the pressure of time led us to conduct the farm survey even before the first census materials were available. Simple random sampling, therefore, could not be made, because the population was not yet known. By that time, however, we had already defined our geographical area of the village (page 53), and were thus in a position at least to adopt the block sampling method.

We decided to cover all farms on which operators lived on both sides of Bangchan Canal in the immediate neighborhood of Wat Bangchan. This included all farms operated by residents of hamlets BC4 and KY5, and a few farms operated by residents of KY6. It may be seen in the sketch map on page 162 that BC4, KY5, and KY6 form the nucleus of our natural Bangchan Village, the outer zone consisting of BC5, BC6, KY7 and KY8.

125 These two, selected blocks on each side of Bangchan Canal included some 80 homes of Bangchan operators, 25 in BC4, 37 in KY5, and 16 in KY6; and we actually covered 76 farm operators living in these two blocks, or 95 per cent of the total.

A technical problem then arose: should we or should we not limit our sample of these 76 farms?

There appeared to be two advantages of limiting our sample to 76 farms: (1) by so doing we had almost a 100-per-cent sample of farms operated by Gangchan residents who lived in the immediate neighborhood of Wat Bangchan; and (2) since these 76 farm operators were most accessible to us (our field office was on the BC4 bank of Bangchan Canal opposite the temple), much time could be saved in contacting the operators.

The disadvantage of limiting the sample to these 76 farms was that we would not have any representation from operators living in the outer zone of our natural village. This was a serious disadvantage when the primary purpose of our study was one of problem locating rather than one of mere description. To partially solve this problem, we decided to include in our sample also farms operated by residents of the other hamlets, namely, BC5, BC6, KY7, and KY8. Since time and other considerations did not permit an equally large proportion, quotas were allotted for these four hamlets.

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621

TABLE 29

REPRESENTATION OF 104 SELECTED FARMS IN THE TOTAL FARM POPULATION, BY HAMLET
Bangchan, Thailand, 1948

Hamlet	Number of Selected Farms	Village Total	Per Cent
BC4	25	25	100
BC5	7	25	28
BC6	7	38	18
KY5	35	37	95
KY6	16	25	64
KY7	9	37	24
KY8	5	42	12
Total	104	229	45

125 It is seen in Table 29 that seven farms were selected from BC5, seven from BC6, nine from KY7, and five from KY8. At the beginning a quota of seven farms was arbitrarily chosen. The reason for the choice of seven farms was that one might make seven short visits to farm operators in the outer zone in just one trip. This is an important consideration in our type of survey work where constant visits for additional information and checking were necessary. In actual practice, the number of selected farms in KY8 was reduced to five because this hamlet was farthest from our field office, and the number for KY7 was increased to nine to include all farms operated by KY7 residents who lived on the eastern side of the Minburi Road which were naturally easiest for us to reach.

Thus, the sampling technique adopted in choosing 104 farms was a combination of block sampling and quota sampling methods, both being under a more inclusive category of judgment sampling as distinct from random sampling.

Effect of Time Element on the Size of the Sample

After the 104 farm operators living in the seven hamlets were chosen for our sample, records of their business and living aspects were made to cover continuously the period from 1948 through 1953. With the progress of time, it is natural that the size of the sample has tended to decline, since some of these farm operators have died, moved out of the village, or changed their occupation from farm operating to others.

Table 30 shows that the size of the sample has continuously decreased from 104 in 1948 to 103 in 1949, 98 in 1950, 96 in 1951, 96 in 1952, and finally 87 in 1953.[1] It should be noted, however, that we re-visited the village in 1952 and that most of our materials on business and living aspects of the farms were gathered from the sample-farms existing in that year; hence we occasionally referred to the sample of 96 continuing farms.

One way of minimizing the problem of declining size of the sample is to include in the sample new farm operating families which have branched out from the original sample-families. It was found that there were ten such families when we re-visited the village to continue the study in 1952. If this method were adopted, it would mean that the size of our sample would then be 106 farms, a figure which does not differ very much from the original size of 104 farms in 1948.

Another way of solving the problem is to abolish the continuing operator approach entirely in favor of the re-sampling approach -- that is, a fixed sample size is chosen and new sampling is done every time a new survey is to be conducted. This approach, however, has the drawback that

---

*[243] [178] [433] [463] [182]

[1] According to Table 14, crop indices were as low as 86.8 for 1949, and 87.5 for 1952; while those for 1948, 1950 and 1951 were 111.4, 111.1 and 102.7 respectively. It is worth noting that a relatively large number of farm operators changed their occupation (or moved out of the village) in 1950 and 1953. When Table 14 is studied together with Table 30, it is seen that there is a close correlation between change in occupation (or change of farming place) and crop failure in the preceding year.

[TEXT CONTINUED ON PAGE 180]

• 125
178
463
621
166

TABLE 30

CHANGES IN OCCUPATION OF 104 SELECTED OPERATORS*
Bangchan, Thailand, 1948-53

Occupation	1948	1949	1950	1951	1952	1953
Farm operator	104	103	98	96	96	87
Farm laborer	-	-	-	-	1	3
Trader	-	-	-	-	-	2
Investor	-	1	1	1	1	3
Professional	-	-	-	-	-	-
Public servant	-	-	-	-	-	-
Home enterpriser	-	-	-	-	-	-
Priest or novice	-	-	-	-	-	-
Miscellaneous	-	-	-	-	-	1
Disappeared	-	-	5	7	6	8
Total	104	104	104	104	104	104

* Explanation for those changing occupation:

1949 A became an investor.

1950 B moved out to unknown locality.
C moved out to Lam Kralog.
D moved out to Sai Kong Din.
E moved out to Bang Plee.
F moved out to Bang Plee.

1951 G died, and family moved out to unknown locality.
H moved to Bangkok.

1952 H moved back from Bangkok into the village, became farm laborer.

1953 I moved to Lard Krabang.
J stopped farming, became an investor.
K stopped farming, became an investor.
L stopped farming, became a trader.
M stopped farming, became a farm laborer.
N stopped farming, became a farm laborer.
O's occupation became obscure (under miscellaneous).
P stopped farming, became a trader.
Q's family lost its identity, was annexed by a farm operating family not in the sample.

125 it would deny any benefit that would arise out of continuous observation of each farm and farm operator through a series of years. With a view to retaining this benefit of continuity, we decided to adopt the first method -- that, is, we included in the sample the ten new families branching out from the original sample-families. Thus, in our subsequent study in 1952 the size of our sample became 106 farm operating families.

There were, however, some types of data which involved records in the past four or five years, such as harvested crop during 1948-52, accumulation of wealth, major receipts and expenses during the same period. In these cases we naturally used the continuing sample of 96 families.

*243 Composition of Farm Operating Families

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592 Table 31 shows that the size of the farm operating family decreased from 6.3 in 1948 to 5.7 in 1952. It also shows that, while the number of adults remained more or less constant, the decrease in the size of the family was due almost entirely to the decrease in the number of the young from 2.5 in 1948 to 2.0 in 1952.

*243
162
592
182
178
[582] A possible explanation for this lies in the economic consequence of the war. Strict government control of the price of rice and of the internal movement of paddy during the war and also in the immediate postwar period has so adversely affected the economic condition of rice farmers that marriage has often been postponed. In cases where

[TEXT CONTINUED ON PAGE 182]

APPENDIX B

SCHEDULES USED IN THIS STUDY

• 125 I. Schedule 2.

RICE PRODUCTION COSTS AND INCOME, B.E. 1948, BY HOUSEHOLDS

10. GENERAL

101. Mu Ban   House No.   102. Name

103. Date   104. Informants

OUTGO

RAI WORKED

11. By separate parcels:

111. Size   112. Rai

113. Location   114. Distance from home

115. Direction

12. By rice variety:

121. Variety   122. Rai

123. Parcel No.   124. Expected harvest date

13. Rai owned:

131. Owned free   132. Mortgaged and terms

14. Rai owned, not worked, not rented out:

141. Rai   142. Description

143. Location   144. Disposition

125 15. Rai used not producing rice:

151. Rai for house — 152. Rai for garden

153. Other — 154. Note tenure if not owned

16. Rai rented in:

161. Rai — 162. Parcel No. (111)

163. From — 164. Rate

MATERIALS CONSUMED

20. Seed:

201. Variety No. (121) — 202. Amount

203. Source — 204. Price or value

21. Fertilizer:

211. Kind — 212. Amount

213. Source — 214. Price of value

22. Other (oil, salt; etc.):

221. Kind — 222. Amount

223. Source — 224. Price of value

LABOR UTILIZED

30. Family workers:

301. Name (sex, age) — 302. Relationship

31. Workers hired by year:

311. Name, sex, age — 312. Origin

313. Agreement

32. Piece work:

Process	workers, origins	Quantity	Rate	Total cost
321. Preparation	3211	3212	3213	3214
322. Uprooting	3221	3222	3223	3224
323. Transplanting	3231	3232	3233	3234

125

324. Harvesting	3241	3242	3243	3244
325. Other	3251	3252	3253	3254

CAPITAL GOODS USED:

40. Buffalo owned:

401. Workable
402. Young
4011. Names
4012. Value
4013. Life
4014. Residual value (meat, hide, other)

41. Buffalo rented in:

411. No.
412. Value
413. Owner
414. Dates
415. Rate

42. Buffalo costs:

421. Food
422. Labor
423. Medicine (for what)
424. Other

43. Buffalo outfit-yoke:

431. No.
432. Life
433. Cost, each

44. Buffalo outfit-yoke rope:

441. Material
442. Meters per year
443. Cost

45. Buffalo outfit-other rope:

451. Lead rope material
452. Meters per year
453. Cost
455. Nose rope material
456. Meters per year
457. Cost

46. Harrows:

461. No.
462. Material
463. Life
464. Cost, each

• 125 47. Plows:

471. No.

472. Types

473. Cost, each

	Parts	Material	Life	Cost
474.	Share	4781	4782	4783
475.	mold board			
476.	Handle			
477.	Hitch			

48. Sickles:

481. No.

482. Life

483. Cost

484. Times whetted

485. Cost

49. Weeding knife:

491. No.

492. Life

493. Cost

50. Hoes:

501. No.

502. Life

503. Cost

51. Shovel:

511. No.

512. Life

513. Cost

52. Winnowing Machine:

521. No.

522. Life

523. Cost

524. Upkeep

53. Other tools: (water wheel: threshing pole: rake: etc.)

531. Kind

532. No.

533. Life

534. Cost

125 54. Boats:
541. Type
542. No.
543. Life
544. Cost
545. Upkeep
546. Residual value

55. Windmills:
551. No.
552. Cost
553. Upkeep
Parts Size
554. Arm 5541
555. Post
556. Pulley, shaft
557. Rope (Chain)
558. Life
559. Cost

56. Noria:
561. Kind
562. No.
563. Life
564. Cost
565. Upkeep

57. Engine:
571. Type
572. Life
573. Cost
574. Upkeep
575. Fuel Type
576. Amount
577. Cost

58. Watch house:
581. Material
582. Life
583. Cost

60. Other water, irrigation costs:

70. Building Material:
701. Use
702. Kind, amount
703. Source
704. Cost
705. Life
706. Repair

125 71. Taxes:

711. Kind
712. When due
713. Cost

72. Other costs:

INCOME

80. Rai rented out:

801. Rai
802. Description
803. Location
804. To
805. Rate
806. Cost

81. Buffalo rented out:

811. No.
812. Value
813. Life
814. To
815. Period
816. Rate

82. Equipment rented out:

821. Kind
822. No., amount
823. To
824. Period
825. Rate

83. Rice sold:

831. Variety
832. Amount
833. Harvest date
834. Sale date
835. To
836. Price
837. Straw sold

84. Rice kept:

841. Variety
842. Amount
843. Harvest date
844. Value

85. Family rice work wages:

851. Name
852. Employer
853. Work, dates
854. Rate

* 125 856. Net wage

86. Other income:

II. Schedule 2a (Simplified form of Schedule 2)

1. Name
2. Date
3. Rais worked
4. Rais rented in
5. Rais rented out
6. Rais owned
7. Home lot
8. Seed and planting method
9. Family labor used
10. Hired labor used
11. Piece work
12. Buffaloes used
13. Buffaloes owned
14. Buffaloes rented in
15. Buffaloes rented out
16. Ropes; yoke (number, life)
17. Ropes neck
18. Ropes nose
19. Ropes lead
20. Plows
21. Harrow
22. Sickles
23. Knife
24. Hoe
25. Shovel
26. Box bin
27. Mat bin
28. Basket
29. Chinese broom
30. Coconut broom
31. Pitchfork
32. Kata
33. Rake
34. Wood shovel
35. Boat
36. Sampan
37. Chala
38. Mard
39. Windmill
40. Rahad (Noria)
41. Winnowing machine
42. Building
43. Engine

125 III. Schedule 11

ACREAGE AND CROP BY YEAR

Name of operator............................ Date...............

Year	Area devoted to rice	Harvested crop
1949	.... rai	...........tang
1950	.... rai	...........tang
1951	.... rai	...........tang
1952	.... rai	...........tang

IV. Schedule 12

SPECIAL RECEIPTS AND EXPENSES DURING 1948-52

1948

Kind and amount of special receipts......................
....
....
Kind and amount of special expenses......................
....
....

1949

Kind and amount of special receipts......................
....
....
Kind and amount of special expenses......................
....
....

1950

Kind and amount of special receipts......................
....
....
Kind and amount of special expenses......................
....
....

1951

Kind and amount of special receipts......................
....
....
Kind and amount of special expenses......................
....
....

1952

125 Kind and amount of special receipts..........................
....
....

V. Schedule 13

ORDINARY HOUSEHOLD EXPENSES, MARCH 1952 - FEBRUARY 1953

Name of operator......................Date....................

Kind and amount of goods consumed:

Paddy.........................tang
Coconut.......................fruit
Palm sugar....................can (of twenty litres)
White sugar...................kilograms
Shrimp paste.................. "
Onion......................... "
Garlic........................ "
Dried chili................... "
Salt.......................... "
Curry essence................. "
Limes.........................baht
Tamarind......................kilograms
Fish.......................... " ; bought.......kilograms
Vegetables.................... " (per day)
Fish sauce....................bottles
Fermented fish................barrels; home made.......barrels
Meat..........................baht
Dried areca................... "
Betel leaves.................. "
Lime..........................kilograms
Native tobacco................bundles
Tobacco binder................bundles
Matches.......................boxes
Soaps.........................soaps
Eggs..........................eggs; sold.......eggs
Medicine......................baht
Temple contribution...........baht
Contribution to neighbors.....baht
Personal expenses.............baht
Clothing......................baht
Children's allowances.........baht
Kerosine: for light.....can; for fishing.....can; for irrigation.....can.

125 VI. Schedule 14

FARM AND HOUSEHOLD INVENTORY

Name of operator......................Date..................

Item	Quantity	Present or replacement value
Land		
Building		
Buffaloes		
Farm implement		
Plow		
Harrow		
Roller		
Sickle		
Weeding knife		
Hoe		
Shovel		
Windmill		
Noria		
Gas engine		
Pitchfork		
Kata		
Rake		
Chinese broom		
Coconut broom		
Basket		
Mat bin		
Box bin		
Winnowing machine		
Wooden spatula		
Others		
Boats		
Sampan		
Kard		
Chala		
Others		
Fishing equipment		
Net		
Trap		
Spear		
Hook		
Pressure lamp		
Others		

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Item	Quantity	Present or replacement value
Poultry and other livestock		
Chicken		
Duck		
Others		
Kitchen utensils (enumerate)		
Bedding (enumerate)		
Storage (enumerate)		
Furniture (enumerate)		
Miscellaneous (enumerate)		

125 VII. Schedule 15

BRIEF HISTORY OF FARM OPERATOR

Name of operator....................Date....................

Name of spouse......................

Other members in the family

Name......................Relation....................
Name......................Relation....................
Name......................Relation....................
Name......................Relation....................
Name......................Relation....................
Name......................Relation....................
Name......................Relation....................
Name......................Relation....................

Date of first marriage............
Date of starting an independent family............
If not branching off from old family, date of assumption of familyheadship..................

List kind, quantity, and value of parental gifts when branching off:

Item	Quantity	Value
....	....	.....
....	....	.....
....	....	.....
....	....	.....
....	....	.....
....	....	.....

List kind, quantity, and value of wealth accumulated during nascent period:

Item	Quantity	Value
....	....	.....
....	....	.....
....	....	.....
....	....	.....
....	....	.....

Describe past incidents of significance which had occurred to you:

125 VIII. Schedule 16

BRIEF HISTORY OF FARM LABORER

Name of laborer........................ Date....................
Age........Education................. Date ordained............
Date conscripted..................... Date married.............
Name of father..........of mother........of spouse............
Names of children.............. ....
....

Work record during past five years:

Year	Employer	Wage
1953	....	....
1952	....	....
1951	....	....
1950	....	....
1949	....	....

Information on condition of parents:

....
....
....
....

Information on the condition of the laborer:

....
....
....
....

125 IX. Schedule 17

CHECK LIST OF ECONOMIC CONDITION OF OPERATOR

Name of operator.................... Date.................

Rai worked............Rai owned...........Rai rented in......
Rai rented out........... (all in 1952 rice year only)

Rental rates in 1952: Rate paid.......Rate received.........

Paddy stock on hand at the end of March, 1953........tang

Outstanding debts in December, 1952 (before settlement by money received from the 1952 crop):
Long term loans: Amount.......baht Rate of interest.....
Amount.......baht Rate of interest.....
Amount.......baht Rate of interest.....

Credit purchase account: Total......baht Principal,,.....

Has credit purchase account of 1951 been fully paid at the harvesting season of that year? (Check) Yes.... No....

Amount of credit purchase account that was carried over from last year..........baht. Of this how much was the principal, or the amount agreed upon at the harvesting season of last year?.............baht.

The operator's comment on general debt situation:

....
....
....
....
....

The operator's comment on debt situation of the people he knows:

....
....
....
....
....

125 X. Schedule 18.

DAILY WORK RECORD OF CHOM FARM STAFFS

Date____________

Hour	Kind of Farm Work				
	Worker A	Worker B	Worker C	Worker D	Worker..
0:00- 0:30					
0:30- 1:00					
1:00- 1:30					
1:30- 2:00					
2:00- 2:30					
2:30- 3:00					
3:00- 3:30					
3:30- 4:00					
4:00- 4:30					
4:30- 5:00					
5:00- 5:30					
5:30- 6:00					
6:00- 6:30					
6:30- 7:00					
7:00- 7:30					
7:30- 8:00					
8:00- 8:30					
8:30- 9:00					
9:00- 9:30					
9:30-10:00					
10:00-10:30					
10:30-11:00					
11:00-11:30					
11:30-12:00					

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Hour	Kind of Farm Work				
	Worker A	Worker B	Worker C	Worker D	Worker..
12:00-12:30					
12:30-13:00					
13:00-13:30					
13:30-14:00					
14:00-14:30					
14:30-15:00					
15:00-15:30					
15:30-16:00					
16:00-16:30					
16:30-17:00					
17:00-17:30					
17:30-18:00					
18:00-18:30					
18:30-19:00					
19:00-19:30					
19:30-20:00					
20:00-20:30					
20:30-21:00					
21:00-21:30					
21:30-22:00					
22:00-22:30					
22:30-23:00					
23:00-23:30					
23:30-24:00					